

# Health and Empire

Francis Fremantle

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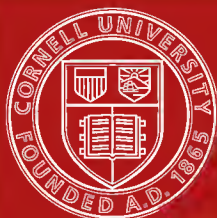
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A traveller's study of health and empire



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# HEALTH AND EMPIRE







### PREACHING INOCULATION

Outside a Small, Plague-stricken Town in the Punjâb.

(The preacher is a missionary, and the picture illustrates two vital principles—that the essence of health-promotion is education of the public, and that the chief agents must be those most in touch with its daily life.)

# A TRAVELLER'S STUDY OF HEALTH AND EMPIRE

BY  
FRANCIS FREMANTLE

COUNTY MEDICAL OFFICER OF HEALTH

*Author of "A Doctor in Khaki"*

*"Salus populi suprema lex"*



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DEDICATED BY PERMISSION TO  
THE STATESMAN-PIONEER  
OF A HEALTHY EMPIRE  
THE RIGHT HON. JOSEPH CHAMBERLAIN, M.P.  
BY ONE OF HIS MANY  
YOUNG DISCIPLES AND FOLLOWERS

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## PREFACE

CIRCUMSTANCES and a kindly master in the shape of a County Council enabled the author of this book in 1903 to leave his work in charge of a deputy and to set off on eighteen months' travel. His direct object was to study the wider problems of health and empire, in other climates, in other races and under other systems of government, and so to fit himself, should occasion arise, for parliamentary service. His ultimate aim was and will ever be to persuade the public of the significance of those problems and to secure a due attention to their solution in the future administration of the British Empire.

A year was allotted to wider travel, six months to study in countries nearer home. The chief extreme from conditions at home would be found in the Asiatic tropics, where orderly government and primitive conditions of life would give the basis of numbers, variation and administrative experience required. It seemed best then to concentrate on India, and there, as an integral part of the sanitary administration, to study one district first for a whole winter's season, for one season's visitation of the plague. The governments of India and of the Punjab were

most helpful in advancing this plan. "In six months," said a high official in Simla, "you will know more of Indian problems than any but a dozen members or so of the House of Commons." The exaggeration was a pledge of interest ; but no one certainly, when once a Member of Parliament and man of rank, can obtain in a mere visit an equally intimate experience of Indian life and rule. Moreover the pay of a plague medical officer is ample and is a useful subscription to the traveller's purse.

A winter was the result in the Lahore and Amritsar districts, and then a dash from Lahore to Peshawar and the Afghan frontier, through Lahore again south-eastwards to Calcutta. There was no time to lose, for war had broken out in the Far East. Visits were paid in passing to various cities and lands, Burmah, the Malay States, Singapore, French Cochin-China, Hong-Kong, Canton, Shanghai, Japan, and so to the seat of war. Physicians and surgeons in every hospital, workers in every laboratory, medical officers of health in every port and town unlocked the secrets of each place in turn ; the hospitality and friendship surpassed those of freemasonry and can never be repaid. A short experience of war, of Northern China and again of Japan completed the Asiatic chapter. Passing by the Hawaii Islands, America was entered at San Francisco ; and a few weeks spent in passing up the west coast to Vancouver,

over the Rockies, across the prairies to Winnipeg ; down to Chicago and St. Louis for the world's fair ; across to catch the spirit of health administration in three or four cities in the eastern states. A last winter was sufficient for the purpose in view in Paris, Geneva, Berlin and Hamburg and certain towns on and off the way.

This book, written for general rather than professional consumption, is designed to carry a reader, perhaps only tepidly interested in his country's welfare, through the more intense and profitable experiences of the traveller, without the travel's drawbacks. It does not profess fully and scientifically to prove the statement that its title would suggest. But it expects to be read with common intelligence and an open mind, and trusts that the reader will then agree as if from personal experience in the fundamental importance to a modern empire of attention to the public health.

Thanks are due to Mr. Chamberlain for permission to dedicate the book to him, for a kindly expression of sympathy with its aim and for the dates of his speeches in point ; but infinitely more for those speeches themselves and the inspiration thus given to medical officers of health in their work and ideals on behalf of the state.

Grateful acknowledgment is due to *The Times*, *The Lancet*, *The National Review* and *The Civil and*

*Military Gazette* of Lahore for permission to republish ; to Professor W. J. Simpson, the first living expert in imperial health, for advice and assistance ; and to various friends of all races and degrees for their help towards the fascinating experiences that have resulted in this book

An Imperial Conference and the crowning of a new King have marked this year in the history of the British Empire. The future of our empire will rest, it is said, on treaties, tariffs, and defence. These pages seek to show that defence of health is as important as defence of territory. For disease is a deadlier foe than man ; health and *morale* give greater strength than armaments. And mutual effort throughout the sister-dominions of the crown will be far more effective than independent action in building up the imperial strength and in diminishing the piteous tale of sickness and misery, of weakness, inefficiency and death.

The attention of all has been called to the heritage of empire. In a few weeks attention will be diverted to holidays and health. It is hoped that this book may aptly combine the two ideas and bring home to those who are well and strong the importance of the physical asset to the security of our empire.

FRANCIS FREMANTLE.

22nd June 1911.

# HEALTH AND EMPIRE

## THE ARGUMENT

TURN over the fat, blue, repellent volume of figures issued by the Registrar-General every year and on page 112 of the last Report, that for 1909, you will find the Birth-rates and Death-rates of thirty-four different countries for the last twenty-nine years. Here are the actual facts, that record the strength and weakness, the rise and fall in human strength of the modern world.

Here we have the preliminary mandate for the Public Health Service, by which it shall direct nations how to be fruitful and replenish the earth, to conserve their human asset, to diminish their tale of sickness, which is strength and labour lost, to promote and strengthen life and to postpone death.

Here we see the British death-rate reduced from 20 deaths every year out of 1000 living in 1891 to 15 in 1908; the Australian death-rate reduced from 15 to 10; the German from near 25 to 18; the French from 23 to 19; while the Japanese rate is still 21 and the Russian 30. What individual sickness and suffering do these figures represent! What national weakness and loss of productive power! How much might have been prevented! How much

may in the future be prevented ! What promise for those nations that recognise, those individuals who desire to utilise, the value of health to empire !

But of what value is all this talk of empire, if we can promise no manhood and womanhood for its development ? Here then on this same page 112, of world-wide moment, let us notice, not only the general reduction of the death-rate, which has its inevitable limits, but an equally general reduction in the birth-rate, which knows no bounds. A quarter of a century back 1000 Britishers brought into the world over 32 young Britishers every year to carry on and develop the work of the 19 who died. Now, to replace the 15 that die, only 26 enter the lists. The Australian rate is reduced to 25 ; the French to 20 ; while the German is still 32, the Russian 48 and the Japanese, alone of all nations, has risen from 25 to 34—ay, and may continue to rise.

A vivid scene may attract attention ; and the scheme of the book opens in its first chapter with the impression of six winter months spent in a life and death struggle with plague in the Punjab, a gigantic struggle—far more deadly than any war—in which over 7,000,000 have lost their lives in the last fourteen years, and to which we see at present no ending. We are at once face to face with the health responsibilities and vulnerability of the Empire.

An experience of this sort, in individual and daily touch with Indian village life as a responsible officer of the imperial administration, gives an opportunity, unusual to a traveller whether medical or lay, of estimating the value of British rule. Chapter II.

shows in certain respects the success of this rule and at the same time the inevitable dissatisfaction of an Oriental in being thus deprived of his gamble in life, a fact which is seldom realised by Europeans at home in considering the dilemmas of eastern government.

The third chapter introduces the scourge of hydrophobia and the miraculous saving of life affected in India by science and government ; the fourth shows the light now shed by the same means in Bombay and Hong-Kong on the cause of plague, an essential preliminary to its extinction ; the fifth deals with another imperial danger in the disease named *kakké* or *beri-beri* in Singapore and *Kuála Lumpúr*, the fascinating capital of the Malay States.

Here, as also in the sixth chapter, the direct value to the state of properly equipped scientific research, the essential preliminary to efficient measures against disease, is further illustrated by the French hospital at Saigon, the laboratory of the international municipality at Shanghai and the Japanese Institute at Tokyo, in which the plan of campaign was being prepared not only against the plague, snake-poison, *kakké* and hydrophobia, but also against smallpox, erysipelas, tuberculosis and diphtheria ; against cholera, typhoid, dysentery and anthrax ; against glanders and tetanus in the horse ; against rinderpest in cattle ; against the destructive action of red ants on sugar-cane and other diseases of plants, grains and trees. With this is contrasted an abortive scheme of vaccination instituted by the late Corean authorities.

The seventh chapter, in discussing the development of the Malay States, deals with a detail of sanitary

progress, now much to the front at home, the healthy and economic planning of towns in advance, as illustrated by Kuála Lumpúr, their capital; the eighth shows the difficulty of housing and the opportunity of town-planning in the further development of the colony of Hong-Kong.

The ninth chapter gives glimpses farther east of education and public health in Japan, a country to which we may well look for new applications of European methods, where the start is made with open minds, a clean slate and a hearty and progressive public spirit.

Here we are at the theatre of war; and war, the historic foundation-stone of nations, the struggle for existence, the avenue for commercial development and social progress, preaches us a most striking sermon on the value, the national necessity, of medical work and above all of the prevention of disease.

Chapter X. gives an epitome of the war in the graphic incident of the battle at Ta'hsi Chiao and the evacuation of Niuchwang, reprinted by kind permission from *The Times*.

The proprietors of *The National Review* have allowed the reproduction in Chapter XI. of an article describing the chief Japanese naval hospital, in charge of an English-trained Surgeon-General, as a type of the several that were visited by the courtesy of the Foreign Office at Tokyo and the British Ambassador. Chapter XII. shows the remarkable organisation of the Japanese Red Cross.

Chapter XIII. suggests the aftermath of the Russo-Japanese war; and Chapter XIV., as its corollary,

is based on a paper read before the Christian Conference on religion in the far east. These chapters are not wholly irrelevant to the theme ; for war, diplomacy and spiritual strength are essentially related to the public health ; and he would indeed have a warped mind who witnessed such scenes as those described without including them in his estimate of imperial strength.

Chapter XV. takes us to America, where the commercial value of a reputation for health was attested by the action of the late Mayor Eugen Schmitz, who declared that plague was not plague, and was defeated in his perversion of the truth only by Federal action on firm administrative and sound scientific lines. *Corruptio veri pessima* ; in lesser degree the same truth holds good in English administration of public health.

A chapter on Federal Hygiene in the States supplies an example for the co-operation of all constituent communities and the practical utilisation of the health information at their command in the future development of our own empire.

Space has prevented any adequate account of further experiences ; and it seemed best to omit them ; for the new Encyclopædia itself would not contain the books that should be written on the themes that presented themselves—of slums in Winnipeg, of meat and twenty-three languages in Chicago, of tall houses and boulevards, the exceptional care of the public health in Massachusetts, and other American conceptions on the grand scale ; of school-feeding and Continental schools ; of Geneva

and the milk-supply; in France, of the struggle against tuberculosis, the cleanly streets and sewerage of Paris, the municipal slaughter-houses, the river-side ambulance stations, the state protection of destitute infants, the Assistance Publique and the Public Health Law of 1902; in Germany, of school-hygiene, milk-supply, the museums of public health, national insurance against accidents and sickness, and the housing philanthropy of the Krupp family at Essen.

If the microscope is essential for the scientific progress of public health, there is still more need of telescopic study in administrative methods and practical experiments. Hitherto content with local experience, pioneers and teachers of Public Health must in future adopt a more cosmopolitan method. This subject is a study of empires, not villages; of all climates, not one; of all races, all conditions, all times.

What then is the profession of Public Health? It is the cure of bodies in the mass; it is the charge of the primary forces of the nation, which correspond directly to their environment and are capable of gradual atrophy through neglect or of almost infinite development by the light of modern knowledge; of forces on which in almost direct proportion depend the effective commercial, mental, spiritual power of the country; of forces which should be the first care of government and often have been its last; which can be and actually are in large measure affected by legislation and which, if rightly used, should become the chief corner-stone of the Empire.

Life is a battle and the battle is to the strong.

Health, hitherto regarded with benevolence as an ornament, must henceforth be counted a weapon essential to every part of the national life. Health to a nation is as vital as good material to an engine ; as exact alloy to a coin. It can be trained and developed to increase the output ten and a hundred fold both in variety and in degree. But left to itself it is neglected, forgotten ; it loses power and the public wonder at the failure of the national machine, which appears to their diverted attention so full of wonder and promise.

An offensive policy is the best defence. A healthy body will best cope with disease. But prevention of disease, as of war, has none of the tragic pomp and glory that attract attention to its cure. Prevention of sickness in the individual implies constant self-restraint and a careful habit of life. Prevention of sickness in the community implies wise statesmanship, detailed perseverance and mutual co-operation between statesmen, officials and the people. The care of personal health is civilised selfishness in its logical extreme. The care of the public health is the very incarnation of reasoning unselfishness.

The instincts of animal man lead him to struggle for food, physical pleasure and existence ; lead him to cultivate personal health for those ends. The instincts of civilised man teach him that mutual support may replace competition ; prompt him to congregate and move freely amongst his fellows, and to co-operate for the public health. The health of the individual has been ever an axiom of human life ; the health of the community has been an occasional

instrument, rediscovered in times of need by great statesmen and soldiers, and soon again returned to the dusty shelf. The baths and aqueducts of Rome, that brought three hundred gallons of water a day for every inhabitant; the detailed rules of the Levitic code for cleanliness and for the avoidance of infection, fill with surprise the Londoner, content with his thirty gallons and grumbling in wilful ignorance against the new-fangled by-laws of his Borough Council.

But now the tide again is turning; the health of the community holds in increasing degree the attention of the legislature, the executive and the public. Disraeli was probably the first prime minister in recorded history to pronounce with all the authority of his office the supreme importance of the popular health. The interests of the working classes were, he declared, paramount, and the working man's health was his greatest asset. It was he that gave public health its *magna charta* and created the present sanitary authorities in the Act of 1875; it was Lord Salisbury that created county councils in 1888; Mr. Gladstone, parish councils in 1894; and during the last twenty-five years big acts and little acts, by-laws and regulations have been formulated in bewildering confusion. A codifying, unifying and extending measure is urgently needed.

The community pays for these measures by an increase in the rates; but their effect has been a very large reduction in the amount of sickness and in the number of deaths, with the consequent average addition of five years to every infant's expectation of

life. During the last twenty years the death-rate for England and Wales has fallen from 20 to 13·4 per 1000 per annum. In every 1000 of the population, therefore, 6 or 7 lives or, in a population of 35,000,000, over 120,000 lives are saved every year. It will be remembered too, that a low rate of sickness and death means increased health and spirits to all, greater happiness and a larger capacity for work. The friendly societies tell us that thirteen times as much work-time is lost by sickness as by death.

But this improvement in the national well-being is not by any means entirely due to the law or to the sanitary officials and authorities that administer and execute it. A large share of credit must be given to the people themselves, who in their societies and papers, their schools, their family life, are learning more and more to inculcate, at least on each other, the lessons of sound health. Medical officers, in this respect, are preachers, content to see their ideals gaining ground, without receiving much share of public recognition. The vast importance of this lay co-operation must never be forgotten. It is a better stepping-stone to the attainment of the ideal than any number, however efficient, of acts, regulations or officials.

Yet, despite the facts, the public health has not attained proper recognition. Soldiers, politicians, preachers, councillors, seldom refer to the subject except as a question of mere humanity. Humanity it undoubtedly is. But humanity plays only a minor part in the rivalry, on which prosperity of communities must in this life depend. For this end the

nation aims at the maximum of effective output with the minimum of effort. The output varies immediately with the health and strength of the nation ; efficiency and economy of effort vary with its intelligence and education. Health is possible without education, but education is impossible without health. And so, for mere national efficiency, the public health is of all things most important.

Times without number has the influence of health on military operations asserted itself in an extreme degree. The Assyrians before Samaria, the ill-fated Walcheren expedition, our South African army at Bloemfontein, the standing camp of the United States army in its war with Spain, are illustrations only confirmed by the attention paid to the preservation of health in the Manchurian army of the ever-zealous Japanese.

Time and time again have nations suffered the most serious loss through epidemic or endemic scourges of disease. The 7,000,000 of lives lost through the epidemic of plague, now again on the increase in India ; the losses from malaria, yellow fever, blackwater, sleeping sickness or other tropical diseases, which till the end of the last century made tropical possessions the most expensive jewels in an imperial crown ; the decimation by disease of the labourers on the Panama Canal, that defeated De Lesseps and ruined his magnificent project ; are they not sufficient evidence of the value of health to empire ?

But now the curtain is lifting. We have the keys to the cause of the plague, the cause of malaria, the

cause of yellow fever, the cause of sleeping sickness ; and in some cases we already know how to fit the key in the lock, to turn it and open the gate. In others, as in smallpox, we can open the gate without a key. And so we can let in the floods of health ; and so Dr. Gorgas, by his medical dictatorship, has enabled the United States to triumph where De Lesseps failed, and has taught the world that attention to the public health is the avenue to achievements and to wealth beyond the dreams of avarice.

If such are the striking lessons of the tropics, such also are the lessons here at home. We, too, have our preventable deaths and ailments, due largely to the artificial growth of town life ; we, too, at home suffer incalculable loss and misery from unnecessary sickness ; the effect being only hidden by the very congestion that is its cause and by the comparative immunity from the wars and pestilence of old days. But our empire calls aloud for men ; and as in the tropics, so also at home by earnest, instead of half-hearted, attention to the public health, we could halve our losses, double our output, quadruple our personal security and happiness and increase a hundredfold our strength in the undeveloped fields of work which have been committed—for a season—to our charge. The battle is to the strong.

So ends this book with Mr. Chamberlain's pronouncements, with an outline of policy for advancement of the imperial health, and above all with an earnest appeal for thought and attention to the health of the community, as the essential basis of empire on sure and progressive lines.



## CHAPTER I

### THE CRY OF THE PLAGUE-STRICKEN PUNJAB

“Dr. F. is requested to proceed without delay to Amritsar and report himself to the Civil Surgeon for inoculation work in the Tarn-Taran tehsil.”

THIS order reached me by special messenger in the wilds of the Lahore district. I was sitting alone in a solitary vacant official bungalow in comfort and grey flannels before a blazing fire, after a drive in pelting rain to an infected village, which refused all my offers of help, charmed I never so wisely. This year, 1903-1904, we offered help; the winter before our predecessors gave it without much asking. We offered help; pointed out the hundreds of villages infected, the thousands dying daily, the myriads that had died since plague attacked the Punjab in 1896. We offered inoculation and told tales of the Bombay jail, where under the same conditions most of the inoculated escaped and most of the uninoculated died; tales of the little villages like Wirana close by, where only five frightened females, fleeing at the approach of the inoculator, escaped inoculation and only those five females died. Statistics are useless; the Indian peasant is imaginative and likes tales, which must be graphic and need not be scientifically correct—as is nevertheless the tale

of Wirana. We talked by means of our keen young Mohammedan munshi, who, being of high family and descended from Ali, the Prophet's favourite nephew, carried weight with the strict Mussulman ; or we talked through our energetic young Sikh compounder, who, wearing his hair uncut and twisted up in a knot inside his turban, wearing the comb, the drawers, the steel bangle and steel miniature knife, the five signs, with the uncut hair, of a true Sikh, was able to appeal to the prejudices of the Sikh ; or, in default of either, we talked through our Goanese bearer or valet, who, Mahratta with a touch of Portuguese in him, Roman Catholic, and attired like an Italian organ-grinder, carried weight with all natives as a member of the aristocracy. A smattering of Urdu enabled one to keep watch over their interpreting ; and the intervals were useful for reflection, which is an essential part of the native's method for the exchange of ideas. We talked rather than harangued ; we drew on the local schoolmaster or village officials or greybeards to ask questions and state objections, and so by degrees we fancied ourselves able sometimes to sow a little good seed. If inoculation seemed a bad card to play, we tried a stronger card and suggested evacuation of the village ; and if popular feeling, or, as in the present case, the elements were against evacuation, we fell back on systematic disinfection. If the villagers had had experience of chemical disinfection and did not like it, we suggested disinfection by heat. And if they refused all these measures, we proposed that they should wait till one out of every four of their friends, their relatives,





(a) Saved from Leprosy.



(b) Saved from Famine.

"Much better, thank you!"

# ZENANA-WORK AT TARN-TARAN.

(The eldest of the twelve healthy girls, boarded out at the Zenana Mission-house from the age of three by permission of their leprous parents, whom they visit every Sunday, here, aged 17, since married and delivered of a healthy child; in her arms a plague-orphan; by her side another child of leprous parents, &c.)

themselves had died, and then should apply to the Civil Surgeon of the district to come and save the rest. Meanwhile we had no desire to interfere with their liberty of dying or to undertake extra work ; and so we wished them good-day.

A nine-mile drive through the rain in a rickety country cart, splashing through the mud, soaked through to the skin, escorted half the way by a couple of strapping fellows, who ride bareback behind us waiting for the honour of an English salaam, brings us eventually to the railway—munshi, compounder, bearer, cook, bedding, inoculation and disinfection outfit, personal baggage, a couple of carts and drivers and myself ; and picking up my pony and syce and my bicycle on the way at Lahore, we take orders from the civil-surgeon at Amritsar and ride and drive out the fifteen miles to Tarn-Taran.

Tarn-Taran, a little town of under 4000, is one of the centres of the Sikh religion ; and twice a year a crowd of nearly 100,000 congregates there to bathe in the tank of the Golden Temple. It is the centre of a large Sikh district and the headquarters of a C.M.S. and a Zenana Mission (Plate 2), whose guiding star is a jovial, athletic, devoted English padre, still young after twenty-three (now thirty) years' work in the country. Knowing the people intimately, through constant visits to the 370 villages of his beat, acquainted with every man of the meanest position who has grown up during his time, and on good terms with all but a few slinking knaves, who have felt his firm hand, President of the Municipality and trusted by Sikh and Christian

alike, he has asked for an English inoculating officer to work with him during this season of the epidemic.

English he must be, for the natives do not trust a native, however well qualified. Every class of native official is, according to western ideas, corrupt; he takes advantage of his position to exact his dues, which we should call blackmail; policemen for a rupee will let anyone through a cordon, if it is safe for him to do so; an interview with an English official of some standing may cost five rupees before the scarlet and gold coated chaprási will announce your presence and business; and even the native assistant-surgeon, whom I succeeded in one district, a man of good repute in the department, was driven about for nothing and was fed by his disinfecting coolies.

So we go into partnership, the padre and I; and the result in a couple of months is 2500 inoculations, with a maximum for one day of 350. Not very good; but not very bad considering that plague was only sporadic in the district during those two months, and that the people had to be persuaded into it in nearly every instance. In India, as in England, it is only a good rousing epidemic that will persuade anyone, from statesman to peasant, to take action, and often, alas, not even that.

Here is the kind of day we spend. We are out in camp. The tents with other baggage have reached their new destination on the backs of our six camels and been pitched outside the town two or three hours, before the padre and I jog in on our ponies, followed by my inoculation-cart and professional suite. The



(a) The Hakim or Doctor and his Dispensary in the Street.

(b) In the Lunatic Asylum at Lahore.

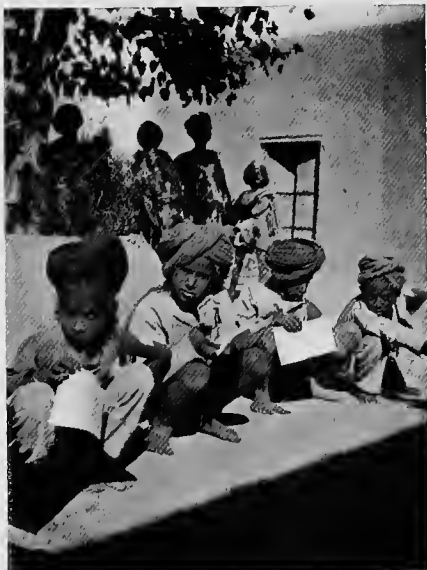
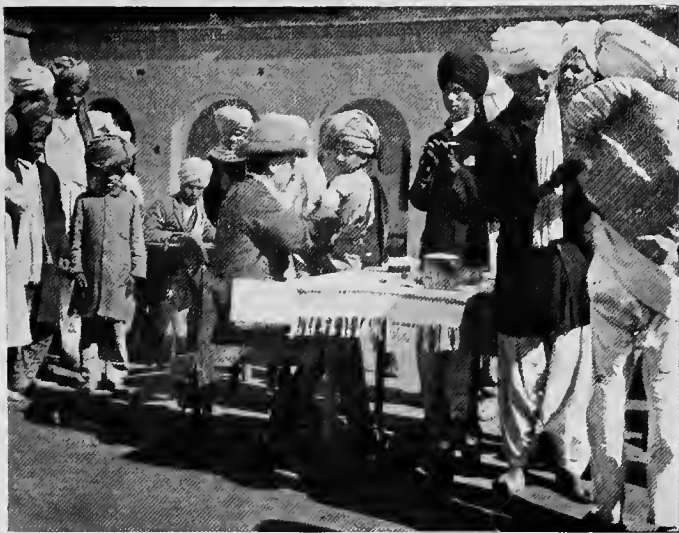
(A victim of Indian hemp—ruler, he will tell you, of the asylum—is linked with a madman always on the grin, who becomes aggressive if you do not grin back. Behind them a Jogi, a wandering religious fanatic, who owns nine rubies, each equal to the treasury of eight kings. To the right, the head-keeper. To the left, a veteran who killed his man thirty-four years ago, and whom, though almost sane, they dare not discharge.



headmen and elders of the village are there to receive us, and one or two hold out a rupee on their open palm for us to touch,—and not to take away, as one of my predecessors naïvely did last year to the old man's considerable surprise. This village contains 2500 inhabitants; it was attacked last year, they say; 300 people died and only 5 of the 150 inoculated. This year the people, they are sure, will come in thousands to receive the wonderful medicine which the kind-hearted government has so graciously sent through these its most charming, honoured and mighty officers. They will announce it through all the village by beat of drum; and do all they can to induce their townsmen to be inoculated. Exeunt all but the Christians, representing a much persecuted little community of about fifty, whom the padre arranged to visit at ten o'clock next day. The descent close by of half-a-dozen *korán*—good shooting and good eating—closes the conference. Exeunt padre and myself, guns on our shoulders, followed by a motley and excited crowd. The sun sets and we return after an hour to join the memsahib for dinner; but we avoid the subject of the birds.

The next morning, after an early breakfast, we walk up to the village and find inoculation-apparatus and staff all ready on the raised earth platform under the big peepul-tree, with roots dripping from its branches into the ground—the common gossip-house of the place. As spectators we have a few pot-bellied brown urchins, clad in a pocket-handkerchief each with a blue turquoise necklace and a steel ring or two through the nose or ear. Chairs and light

wooden bedsteads are brought, the headmen appear and after a little brisk repartee between them and the padre one of them brings his children and his brother's children and his friend's children to be inoculated. The padre goes off to preach. Munshi squats in a corner, takes down particulars of each person, and gives him the certificate to be signed after inoculation (Plate 4). The compounder on the moderately white tablecloth has a magazine of little bottles in front of him, six full doses in each, of Haffkine's prophylactic; a growing cemetery of the empty bottles; an aluminium bowl of oil in which he has sterilised half-a-dozen injection-needles over a spirit lamp; another bowl of carbolic to hold the forceps with which from time to time he opens a fresh bottle and puts it to my nose for me to smell, before refilling one of the two syringes which are kept in constant use. My two chaprásis or messengers are hard at work scrubbing the left arms just behind and below the shoulder, one with soap and water, the other with lysol, by means of lint held in clip-forceps. The lint, it may be noted, requires very frequent changing. Finally the clean patch of left arm, covered by a patch of lint soaked in lysol, comes to the end of the long row in which its owner has been squattingly awaiting his turn and at last he passes me his certificate. I run my eye down the particulars. Unless his health is marked good, I look at his tongue and feel his pulse; as it is most important for the credit of the operation not to inoculate any with plague already upon them, nor to produce an aggravation



(a) Inoculation against Plague.

The Munshi, a Mussulman, in the background, fills in the forms;  
 The chaprási, a Hindu, on the right, scrubs the shoulders;  
 The compounder, a Sikh, in the centre, fills the syringe;  
 The doctor, an Englishman, drives the syringe home  
 The padre, from another world, takes the photograph.

(b) Boys in the School-yard await their turn.



of any other existing fever. According to age I decide the dose, one cubic centimetre at one year, three at seven years, five at fifteen and upwards, and adjust the stop-screw of the syringe accordingly. “*Dekho*—Look out !” And if the compounder has sharpened the needle over night, it slips in and all is over without trouble. If not, the victim makes a grimace, and the onlookers, up to this point silent in their breathless interest, break into a laugh and a brisk exchange of wit follows. The compounder writes the dose given on the certificate ; I add my signature by rubber stamp ; and another inoculation has been added to the roll. We do twenty in as many minutes ; then there is a hitch ; then another twenty and there is nobody left to do. Half-an-hour more and the return of the inoculated to their homes without serious damage has produced a few of their relatives ; and then the stream begins and the work goes on at full pace for an hour or two, accelerated by the return of the padre after his preaching. A score of women and infants are inoculated in a separate compound with other women and infants looking on from every neighbouring roof, cows and buffalo mooing, donkeys braying, children squalling and struggling—a fine pandemonium. And last of all come the sweepers ; no one will be done after the sweepers ; it is the end. Half the inoculated have been Christians, who have risen to a man ; the total number is 120, and the headmen present their books of testimonials and are quite upset when we refuse to testify to their good works in assisting the cause of inoculation. The thousands they promised

would, they say, have come if any human inducement could have had that effect ; they had undergone untold trouble to induce the people ; but the people were foolish. Had not all their own families been inoculated ? They are warned that any outbreak that may occur in the village will be due to their failure to induce the greater part of the village to be inoculated. The government will hold them responsible. They must do better next time or it will go ill with them. And so—good-day.

Let us turn to another scene, where the syringe invaded even the harem. In the south-east corner of the Lahore district there is a town named Gharyala. Passing through the town of Gharyala, where I interviewed the officials six miles before my entry, we came, my native staff of seven and myself, to Patti, a largish town of 8000 inhabitants, where in the previous year they lost 312 people from the plague, only 26 being inoculated, of whom one got the plague and none died. This is an out-of-the-way corner of the district, seldom visited by European officials. Nevertheless, my Sikh compounder, Achhar Singh, a bright youth of nineteen, having galloped ahead on his rough little pony, met me with the chief officials outside the town and the welcome news that it contained the finest rest-house we had yet met on our tour. This had been erected in his own garden by Mirza Mubarek Beg for sahibs on tour, and had been furnished with walnut furniture, apparently from Tottenham Court Road, and a piano made in Bombay. It was six months since the rest-house had been occupied, but there it was ready for use, a

bungalow of considerable size, with every room opening directly on to the verandah, well screened from the heat of the sun, in the midst of Oriental vegetation—the word garden gives no idea—under the care of a native gardener and caretaker. After exchanging the usual salaams and receiving the usual assurances from Mubarek Beg that hundreds and probably thousands would come on the morrow for inoculation, and that his exertions would be, as they had ever been, of incomparable effect in carrying out the wishes of the government to that end, we retired to the solitude of the bungalow. The next day was a hard one. We were up at seven, and after breakfast walked up into the city to inoculate the whole of Umra and Shaja Beg's household, nineteen in all, including the ladies in purdah. These were of the family of Mubarek Beg, for the families lived together in clan, and Mirza and all his family were anxious to stand well with the government.

Mirza Shaja Beg, the son of Mubarek Beg, acted as interpreter, having learned English at the Amritsar school. It appeared that Umra was anxious to get the vacant *Zaildari* or mayorship, which he declared was promised him in succession to his father, who died prematurely when Umra was still a lad. Umra, after my visit to Patti, followed me for five days round the country with a fine *dali* or present of fruit and vegetables, and secured in return a direct note to the deputy commissioner, who told me later, however, that Umra was not the chosen man.

Inoculation, like charity, begins at home, and every available arm should be produced in order to ac-

centuate the merits of the Mirza's family. We found our way by what seemed a small back entrance, although in reality the chief entrance, into the rough red-brick building—red brick being of itself a mark of distinction. A small room, twelve feet square, with lattice windows looking out on to the slums on one side, the balcony on the other, was given up to the purpose. A deal table was with difficulty found and stood in the middle of the room, with a couple of European chairs, quite incongruous to the general surroundings. My Indian staff, of course, could not be allowed in the same room as the women of the household. They therefore prepared the bottles and basins, my clerk showed Shaja Beg how to fill in the prescribed forms, and I was left alone with the gentlemen of the household to inoculate first themselves and then their ladies. The ladies were brought in one by one and dumped down at my side, gazing at me through their peepholes. They were covered, head and all, by dirty cotton shrouds, like the furniture in a London house out of the season. A slit had been made in the sheet behind the left shoulder, and a square inch of brown flesh was presented for the purposes of ablution and inoculation. The opening having been extended a few inches and the lysol vigorously applied, as was most necessary, until the pinky-brown flesh appeared in its native and beautiful tint, the inoculation was performed in dead silence. There was something uncanny in those black eyes watching intently every detail of the operation from within a complete fortress of white sheeting, without any other sign of

life or feeling but the real flabby fleshiness of the left arm. Umra Beg, husband, father, or master as the case might be, was asked to address a few words in explanation of the performance to moderate their presumed anxieties, but in his opinion such forethought was unnecessary, and certainly, in the event, so far as all external manifestations of feeling were concerned, one might have been inoculating a bolster. The son and heir, however, evidently a spoiled young rascal six or seven years of age, displayed no such self-restraint—a wild horse or infant in arms could not have resisted more violently or shouted more lustily, and the pandemonium that ensued, when the father, the mother, the uncle, and a couple of servants endeavoured to give the inoculator a chance, was indescribable. Poor women, they were turned off again into the prison-like desolation of the harem, back to the life of the few yards of God's earth, the dozen or so of God's creatures, that they are ever destined to see on this side of the grave. "Salaam, Sahib!" said Umra Beg. "Salaam, Sahib!" said Shaja Beg. They had done their duty, and they hoped that their efforts and my influence would stand them in good stead when Mubarek retired from his official position and one or other of them besought the deputy commissioner to appoint him to the vacant place. This was an end of inoculation at Patti, for, although the drum was beaten round the town incessantly, though the family Beg assured us that they were doing their utmost to persuade the people to follow their example, though the cloth was spread over the inoculation table in a most tempting

position on the verandah of the bungalow, not another soul availed himself of the government's munificence.

The fact is that inoculation had not and, it seems, still has not as yet had fair play in the Punjab. Compulsory measures being considered out of the question, the inhabitants have been left merely the option of adopting this new method of treatment or refusing it. With their limited horizon of view, they do not think of taking care for the morrow. They wait till the plague comes, and comes in considerable force. Then, like children, they are seized with panic; they apply to the government for aid, and the government sends them the inoculator. But if in England nearly half the children in the schools are now unvaccinated, it is easily understood that in India the vast majority object to inoculation against the plague. Medicines they could understand, charms and incantations they are used to, but a prick with a needle gives definite pain, experience shows that for two or three days afterwards, and sometimes for more, the arm is almost useless, and there is a general feeling of undoubted illness. How can fatalists such as they be expected to realise the eventual benefit of such an unpalatable method? It is only by such obvious instances as that of the little village of Wirana already mentioned, it is only where in the midst of death the inoculated are in life, that the lesson is learned, if at all. And if there is this difficulty for those of some understanding, the difficulty with those who have none seems insuperable.

In the early years of the plague epidemic, one of the ablest of deputy commissioners made a tour through his district, speaking of plague and its prevention. On his second tour, in almost every village, he found a fine temple erected to the Goddess of Plague, the best temple by far in the place, and this even in Mohammedan villages, where they believe in only one God, but thought they might as well be on the safe side. His method was to discuss fully and freely the whole matter with them, to provoke criticism and heckling in order to answer it. "Does your Gospel," they would ask, "say all this about the plague?—Because the Koran does not!" His answer would be ready: "You are perhaps a cobbler: does the Koran tell you how to make a pair of boots?" Or again, the Hindu asks, "Do you suppose angels trouble themselves with little worms? If they have decided to send the pestilence, it is Kismet, and nothing that you can do will prevent it." His answer again was ready: "Providence sends you the harvest, but you must first sow the seed. Providence sends bread through the seed of corn; Providence sends its pestilence through little worms." Then there is the more revolutionary objector: "Government does not really want to save us; it wants to poison us." The answer comes: "If you have a good bullock which is ill, do you try to poison it? How will the government get its revenue if thousands of taxpayers die?" Some there were, who were persuaded and believed. After one of the discourses, half-a-dozen men came the next morning, bearing in triumph an earthworm

eight inches long : “ Sahib, we have got the worm ! ” Education, was the conclusion of this officer, must be the eventual and final preventive, but meanwhile there should be more mild coercion than at present, inter-communication between infected and uninfected villages should be stopped, and with this as a lever privileges allowed to those who disinfect their houses.

In inoculating such a series of cases, one cultivates a habit of routine, and occasionally a detail may by mistake be omitted. In one case, having carelessly failed to screw down the buffer of the syringe which limits the dose, I injected ten times the customary dose into a young fellow, who, though strong and only eighteen years of age, looked of delicate constitution. Although there is little reason for believing that an overdose is poisonous, I was naturally anxious for a whole month until the welcome news came that at least no one at Patti was any the worse for my visit. At Kasel by mistake we gave double doses to about twenty persons, the dosage of the bottles we were then using being discovered to our dismay to be double the strength of the prophylactic we had always used. This was on a Saturday, and I was due at Mian Mir for the Sunday. The compounder who was directly responsible for the oversight, and the young clerk, were made to stay there overnight, and take the people's temperatures in the morning, and again in the evening, but not one was above 100·5, and my assistants were accordingly able to rejoin me on the Monday morning at Tarn-Taran.

Kasel was interesting in several ways. I visited it with the civil surgeon under whom I was working, a Lieutenant-Colonel in the Indian Medical Service, whom I assisted to extract his ten thousandth cataract from a man attracted by his fame from beyond the Himalayas. We drove out the fourteen miles to make inquiries. Last year 500 people were inoculated. None of those inoculated got the plague, although several others in the village died of it. This winter the village had again been infected, so we made out, through the visit of 5 Mohammedan and 2 other inhabitants to the Id-Ghar at Amritsar, on the Feast of Id (28th December). All of them developed plague within five days, and by 19th January, the day of our visit, there had been 74 cases, and already 34 deaths. Only one man, however, despite the successful experience of inoculation in the previous year, volunteered for inoculation. They were told to let the civil surgeon know if more wished for it or for disinfection. By the 1st of February 126 cases had been reported, with 61 deaths. On the 12th of March I met the Zaildar at a neighbouring village, and he told me there had been over 300. I decided therefore to try again, and on the 19th of March paid a second visit to Kasel. To show how difficult it is to secure any information of the disease, we found in the registers that as early as December, when, according to oral information at our first visit, there had been no deaths from plague, 22 people were said to have died of fever, as compared with previous years, when only two or three deaths would occur and those not from

fever. This was obviously an early invasion of the plague. With some difficulty we inoculated 43 persons.

At the village of Jauhal-Raju-Singh we inoculated 132 between four and six o'clock one evening. Four days later, hearing that one of the inoculated was ill, I bicycled over there, after a long day's work, the roads appearing more impossible than ever, and found plague rampant. Evidently, as usual, my first inoculations had been made in a population already terrified by prevalent disease. They were anxious for my help on any lines, but the mischief for the most part was already done. Escorted by the local officials and fifteen or twenty of the population, I paid a visit first to one house, then to another, and so on to most of the wretched hovels infected throughout the village. One would enter through a narrow opening in one of the mud walls, flanking a three-foot lane, into a squalid yard some twenty feet across, six inches deep in mud, occupied by several goats, two or three head of cattle, and two or three *charpays*, or plain native bedsteads, on which a few of the worst cases had been brought out to die. They lay in the last stages of fever, huddled up and dying under the dirty padded bedclothes. The bedclothes were removed, and one went through a certain routine of medical examination, more by way of form and excuse for passing the time than for any other purpose. One passed on into the house, a mud erection on the ground floor, with mud floor, mud walls, a couple of doors open only for our benefit, and a couple of tiny wooden-shuttered windows

that evidently were seldom unbarred. In this dark, dismal space, perhaps twenty feet long and ten wide, were four dying patients on *charpays* and two on the floor, with half-a-dozen friends or relatives crouching by their side, wiping away the saliva from their lips, and giving a little *ghee*, or sour whey. The burden of responsibility was oppressive. What indeed was the value of our European rule and of all our science, under such impossible conditions. To say a few words of comfort ; to warn the attendants against allowing the patients to move, under any circumstances, for fear of heart failure ; to promise a bottle of medicine next morning, knowing full well it would be practically useless in any but the strongest cases, this was all. The next day we returned and inoculated 244 cases, taking as much care as possible that those who were inoculated had not the disease already upon them ; but there can be no doubt some of them were already infected, and, when they are already infected, the inoculation cannot overtake the virus of the plague. In such cases, death after inoculation may well appear to the native to be due to the inoculation, and there are many who say it is most unwise to have anything to do with a village on which the plague has taken strong hold, for such procedure brings discredit upon the operation and deters other villages from applying for it in time. But human sympathy is strong, and the conviction that at Jauhal-Raju-Singh so many persons might yet be saved by inoculation induced me to waive the higher and probably more statesmanlike attitude of refusal. The case is very like that of charity

available in every bacteriological laboratory, instead of in elaborate institutes only.

The inoculation of the rabbits is performed under chloroform. A neat midget trephine removes a small bony disc from the skull; the needle of the syringe is inserted direct into the brain; the scalp wound is left to heal up, as it does perfectly well within a few days; and the rabbit is immediately returned asleep to its cage, the whole operation taking perhaps three minutes. Dr. Kitasato, in Japan, on the other hand, in his research laboratory in Tokyo, does not even trephine, but injects the poison directly, under chloroform, by a needle of the precisely requisite length, along the side of the eye and optic nerve, through the optic foramen into the brain. This method seems astonishingly simple and ingenious, but I must confess that the first rabbit I saw thus treated died on the spot, all attempts at artificial respiration proving useless.

The difficulty of conducting such treatment in this institute may well be imagined, for the virulence of the cords decreases daily, and on any one day arrangements may have to be made—as, for instance, on the day of my visit—for thirty-six doses of all degrees of virulence—so many of third-day cord, so many of fourth, so many of seventh, and so on. Two rabbits were inoculated for the purpose of preparing virus every day, however few patients there might be in the institute. The cord, which is used within the first three days to supply fixed virus, is depended on to supply virus on each successive day, of diminishing virulence, until it has all been

used by the end of the fourteenth day. Should both the rabbits inoculated on any day die, or their cords after death become contaminated at any stage between the inoculation and the attainment of the standard of virulence for which the cords are to be used, the gap in the treatment of all patients is definite and irreparable.

Extreme care has therefore to be taken in the drying-room, in which the cords are kept at a uniform temperature, at a uniform degree of moisture of the atmosphere and devoid of all light, the walls and ceiling being papered in black ; for moisture, light and heat are all disturbing elements.

For each dose half-an-inch of the cord is cut off with sterile scissors and mashed up with a teaspoonful of salt (normal saline) solution, being used one day as third-day cord, the next as fourth-day cord and so on.

*Course of the Treatment.*—When a patient arrives at the institute he is seen by the director, and is ordered treatment according to the intensity and presumed danger of his case. In ordinary cases it will be as follows :—1st day, an injection of fourteenth-day cord ; 2nd day, thirteenth-day cord in the morning and twelfth-day cord in the evening ; 3rd day, eleventh and tenth day cords ; 4th day, ninth and eighth ; and, on successive days, seventh, sixth, fifth, fourth, and third day cord respectively ; then, on the 11th day, back to seventh and sixth day cords, and, on successive days, fifth, fourth and third ; on the 15th day again, sixth and fifth day cords ; then fourth and third ; on the 18th day, sixth and fifth ;

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that trade between towns, dealing as it did with markets direct, spread the plague, which was mainly diffused in his opinion by women who go to mourn at funerals, and who by custom lie on the bed with the patient up to, and even after, death, and on the following night always lie on the bare earth. It was for this reason, he considered, that plague was commoner in women than in men. But he admitted, rather unwillingly, that this difference between the sexes might be due to the transmission of the disease through fleas, since the women are dirtier, and stay more at home ; they are more ignorant and careless about infection ; and, moreover, it was recognised that rats, formerly plentiful, were absent during the plague in these villages, having all died or migrated and, according to the flea theory, left their fleas to find their food on less palatable man. He gave an interesting instance of the value of inoculation in Kesel Gurh in the previous year, when ninety per cent. of the population were inoculated. Twenty of these had plague, and none died, while of the remaining ten per cent. nine had the plague, and six died.

Plague having devastated the Punjab to an increasing extent from 1894 onwards, the Punjab Government decided in 1902 to undertake an extensive scheme of inoculation, devised both in principle and detail by one of their medical officers, afterwards Major Wilkinson, Chief Plague Medical Officer of the Punjab. It was hoped to inoculate a very large proportion of the population in the autumn, in advance of the annual invasion of the plague, which

commences a little before the New Year. Their ordinary medical officers were obviously too well engaged in their other duties to be able to spare time for such an extensive measure. They engaged therefore upwards of fifty young doctors of high professional quality from the London medical schools, at a remuneration sufficient to ensure a selection of that ability which they considered essential to the success of their scheme. This learned expedition has passed unnoticed, but it is one of many instances, unique and unprecedented in the world's history, of experiments made in the development of our empire. These pioneers arrived in September 1902, and for some weeks were expected to do little but accustom themselves to Indian ways of life and administration. For every one of them a particular sphere of work was mapped out, a staff of ample proportions was engaged, and tents and equipment were prepared on a liberal scale. It was a new experiment, and the machine was with some difficulty set to work. Some men were unsuited to the climate; some, despite professional ability, entirely unsuited to the work; and long before the experiment was in full swing a melancholy disaster occurred which shattered the whole scheme.

In a small village named Mulkowal the inoculating officer, whom no one could impugn either on the score of professional ability or sense of responsibility and tact, awaited for six hours, with all his apparatus prepared, the return of the villagers from the fields, to which they had fled on his approach. Eighteen persons were inoculated at Mulkowal and one at

Ferozapore, all from the same bottle. Every one of these cases died of lockjaw or tetanus. This bottle was only one out of a large brew which had left the laboratory at Parel, outside Bombay, four weeks previously. The others caused no tetanus ; therefore the infection was one not of the brew but of the bottle. The question was whether the bottle was infected on the spot or at the time of bottling at Parel four weeks before. The answer depended on expert bacterial examination of the particular bottle concerned. A commission of three was appointed to inquire into the whole matter ; they concluded that the contamination occurred at Parel. The question was referred, however, to the Lister Institute in London and they, after further experiments, first concurred and then threw doubt on this finding. Mr. Haffkine finally appealed to the home government in an exhaustive review of the case ; and a letter to *The Times* from ten leading authorities in Great Britain and the United States showed that Mr. Haffkine had proved his point. Contamination occurred at Mulkowal.

The Indian government, however, had to justify itself to the people and it seized on the methods in use at Parel. It appeared that, a few months before the occurrence of the Mulkowal incident, Mr. Haffkine had for good reason introduced a change in his method of preparing the prophylactic. The modification was based on an analogy with his cholera experiments and on the experience of the Pasteur Institute in Paris, but it opened the way to ten times as many chances of pollution. The government discovered

that this change had been made, and concluded that it might have been responsible for the whole trouble. They ordered a return to the former methods, and, when a sufficient supply of prophylactic, produced on the old lines and tested by more stringent tests than ever, was ready, they were in a position to announce to the natives of the Punjab that recourse could be had, with perfect safety and great advantage to themselves, to the operation for inoculation. The government entirely exonerated the inoculating officer from any responsibility for the infection ; they dispensed with the services of Mr. Haffkine.

It was a lamentable fiasco. Of all the vast supply of prophylactic prepared in advance up to that date at Parel, so long as the question of infection at Parel was still undecided, not one bottle could be used, and in the event it was all destroyed. No further inoculation could be performed until a safe supply of prophylactic could be guaranteed, and by that time it had become spread throughout the length and breadth of the Punjab that nineteen persons had been poisoned by the government's measures.

To continue inoculation under such circumstances, at least with any show of pressure, was clearly impossible ; the government could only fall back on their former attitude of offering assistance where it was asked for. There are some who think it would have been well if the government, so soon as the safety of the Parel prophylactic was ascertained, had continued their scheme of inoculation as if nothing had happened, using as much official pressure as possible, relaxing it only when the popular feeling

against it rose to a dangerous extent. But such is not the principle of the Punjab government, nor indeed of the Indian administration in any department. It is considered the best course to let the people, by slow degrees and by constant affliction, learn their lesson and come to a fatherly government willingly for help, than that they should be coerced into submission to measures which at first appearance often seem to them worse than the disease. It must be at the same time noted that compulsory measures lead to concealment of cases, and so to uncontrolled spread of the disease. The flaw in this argument is that the people do not learn the lesson but continue to die in increasing numbers.

The year after the Mulkowal incident I was touring round the villages of the Lahore and Amritsar districts, and found, in so far as it is possible to arrive at the convictions of the Indian people on any subject, that the fact of the Mulkowal incident rankled in their breasts, and was a very real and probably the chief obstacle to inoculation ; and I am bound to admit that I was not wholly without anxiety myself—perfectly unreasonable anxiety, no doubt—when the padre and I subjected ourselves to inoculation for an example, and at least professedly as a security in our work, in the Gate of the Golden Temple of Tarn-Taran.

This year the government had decided to apply no pressure, and so, instead of the fifty inoculation officers, there were now only six such special officers retained, to whose number I was privileged to be added as a seventh. It was our duty to go round the

villages, preaching, through the medium of our *munshis*, the history of recent outbreaks of the plague, the almost certainty of its recurrence in increasing virulence, and the measures which the government suggested to guard against it. You may prevent disease in the individual, but it is obviously far more effective to prevent it in bulk ; and however great the claims of inoculation to guarantee the safety of the individual may be, there seemed no doubt that infinitely the most effective method of combating the plague was by prompt evacuation of an infected village. The inhabitants, however, could not be left to find their lodging in other villages, for so they would only spread the plague more widely. As with our city improvement schemes at home, accommodation must be found for a displaced population ; and this accommodation would in general be found by the erection, at some little distance from the village, of mat sheds, or other temporary houses, into which the whole population were bound to move, and within which they were to be confined for a certain period until plague was at an end in their midst. In some parts, for instance, of the United Provinces this method had been most effective, but in the Punjab the first difficulty arose in the reluctance of the natives to leave their homes at any cost, and in the supposed insecurity of their possessions and valuables in the new encampment. The second difficulty lay in deciding who should pay for the cost of removal. The answer of the Punjab government was distinct, that the expense must be borne by the locality ; and although in other parts

localities had agreed to bear this expense, and had succeeded almost invariably thereby in stamping out the plague, in our own districts not a single village was prepared to fall in with this suggestion.

Inoculation then was practically useless to the community—for what are 2500 inoculated persons amongst so many? Evacuation was refused. There remained only one suggestion, the makeshift of disinfection. Of this I had but one experience. A wire came to me on 20th December, out in a distant village—"Plague broken out Changa Manga. Go there immediately." I arrived in advance of my staff and equipment, and spent the night with the native forester. A hospital assistant arrived next morning, and set his men hard at work removing, with the help of the inhabitants, the furniture from their infected huts, brushing down the walls with chemicals and washing out the floor (Plate 5). But the people dry the floor afterwards by putting fresh dry earth, which may itself be infected, upon it, and sleep on it themselves with clothes not disinfected. Such a thing as a full-length bath is unknown, and, if we had one, it would be impossible to use it. The first improvement to make was at least to suggest a wash and the disinfection of clothes; the second to disinfect, not by chemicals but by heat. Whether conveyed solely by fleas or not, there was no doubt that the infection came largely from direct contact with the earth. Of these ten disinfecting coolies only one had had the plague; but they had all been made to wear leather boots and leggings. The one exception was found to have objected to his



### Disinfection Out in the Forest.

Coolies at work inside, while tenants, their wives, cattle and other possessions bask in the sun outside. A sweeper's wife in the far corner is dying.



boots and leggings, and to have been in the habit of removing them. It was only this year that they had taken to thus protecting their feet ; formerly their predecessors had suffered most severely from plague. But chemical disinfection by fluids is useless enough in England ; it is quite useless in India as performed in mud huts by the Indian native. It is also very expensive ; and a far better method is desiccation, or disinfection by heat.

My compounder brought a stove for this purpose—a cheap affair of thin iron, in which we burned wood and banana-tops, and anything else handy ; and we started with this to disinfect the infected row of sixteen back-to-back huts. All contents had been turned out into the sun—in itself a good disinfectant. The walls were still painted green with the chemical up to a height of six feet. The colour at least gave confidence and a check on the work done. The floors were scraped, and an inch of earth carted away to the forest. The contents of the hut were now packed inside—a close fit when room had to be made for the stove in the centre of the floor. The little chimney in the roof was stopped up, cracks and doors were closed, and an hour and a half passed before the iron bolts of the door, by their uncomfortable heat, showed that a sufficient temperature was reached inside for disinfection to be considered to have begun. Meanwhile the second and the third huts were packed up again with their ventilated sun-dried contents, ready for the use of the stove when the first hut was finished. It was a long business, and to disinfect seven huts in a day was good work.

Even so, the process was not perfect. We had no clean spare garments with which the poor people might cover themselves while waiting after a bath for their clothes to be heated in the next house. In the second place, when it came to a sweeper's house, the Mohammedan women who were their neighbours would not admit any of the sweepers' things for disinfection into their own houses, and they obviously could not use their houses both for bathing and disinfection at the same time. In the third place, they all object to washing, especially in carbolic, because it smells. And, fourthly, the paint on their gaudy furniture is liable to suffer. Nevertheless, the process is accompanied with perhaps less discomfort than any other system adopted by the Government, and it had the additional and very considerable recommendation that it left the huts hot and dry.

At the end of a winter's work one feels fairly well in despair as to the whole business ; seven years later the despair is confirmed.

The death-rate from plague in 1904 in the Lahore and Amritsar districts in which I worked was 25 per 1000. Over 1,000,000 Indians died of plague in 1904, over 1,000,000 in 1905 ; in 1906, 332,000 and it was thought the end was in sight. But 640,000 died in the first four months of 1907 ; in 1908, 321,000 died ; in 1909 only 175,000, but in 1910 again very nearly 500,000, and this year more than ever. The United Provinces had barely been reached by the epidemic in 1904 ; now with a population equal to that of the United Kingdom they have

been losing 20,000 every week ; and the Punjab 34,000 in one week, 39,000, 47,000, 54,000, 60,000, and so on,—over 430,000 in the first four months of this year in a population of 25,000,000. Imagine Great Britain and Ireland losing the same proportion—over 1,000,000 from plague in half a year. And India as a whole has in fifteen years lost over 7,000,000 from plague. Why wonder at her unrest !

What then can the government do ? The only complete scheme has been killed by the Mulkowal incident ; extermination of rats is impossible ; disinfection on a large scale is impracticable ; evacuation of villages cannot be done voluntarily on any universal scale ; the government will not apply compulsion, and such evacuation is quite useless without a rigid cordon of police or military that will prevent communication between one infected village and others not yet infected. A cordon, it has been proved over and over again, cannot be maintained ; the native who wishes to pass it has only to present some official with a cautious rupee. Extermination of rats in an Asiatic country has often failed ; but here is without a shadow of doubt the key to the problem. The methods formerly adopted had been to give a capitation grant for every rat brought to the appointed place, and before long it was found, for instance in Bombay, that an extensive trade had grown up in the breeding of rats, whereby, at a few annas apiece from the government, many families were able to sustain a comfortable existence. The same thing was once done with regard to poisonous snakes ; a

breeding-farm of extensive proportions was discovered in full operation in order to take benefit of the government grant. But since sentence on the rat-flea has been pronounced for the murder of 7,000,000 persons and over, the best method for his extermination will not be far off. Sulphur is coming again into favour and we are reminded that both in Rome and in Mesopotamia non-poisonous snakes were kept, it is believed, for this purpose. Cats, however, are useless as they may themselves take the plague. In any cases total extermination is improbable.

It is often debated whether even half-measures are worth being continued. Professor W. J. Simpson, in his exhaustive monograph on the plague and in 1907 in his Croonian Lectures, has shown how in history epidemics of plague have come and gone in different countries with long intervals between them, often of one hundred and thirty to one hundred and fifty years. In the eighteenth century, for instance, India seems to have been almost free of the plague, but early in the seventeenth century it suffered severely. The present epidemic is assuming, as far as we can trust previous records, unprecedented proportions; probably after a few years it will die out again. An occasional cynic may argue that, since we have saved so many thousands of lives annually from famine and from wars, it may be just as well to let the plague take their place. To such a pessimistic and inhuman conclusion it is impossible for one moment to submit. It may be that for economic reasons some parts of the Indian Empire would be happier if their population were

less dense ; but it does not follow that we should allow death to stalk uninterrupted, unopposed, and apparently without limit, throughout the country. Economics apart, we may yet be absolutely convinced, whether as doctors or as statesmen, that it is our mission, our duty, to protect the populations included under British rule to the best of our ability against every scourge as it may arise ; and therefore it is urgent that such measures as we have be pushed forward with the utmost vigour. We cannot aim in this world at perfection ; we must often be content with half-measures, and it is through half-measures that we often find the clue to complete control of the situation. But those half-measures must be adopted vigorously and in earnest ; and it would seem a very considerable mistake that such effective measures as evacuation of a complete population should have to depend entirely upon local funds. If anything is to be supported by the general exchequer, whether of the provinces or the government of India, surely it is measures for the prevention, curtailment and stamping out of so terrible an epidemic.

A practical policy is urgently needed, and this practical policy might with advantage, to my mind, go a little further in the direction of compulsion than the Punjab government have lately been inclined to go. In the winter with which this chapter deals, the only duty of the local officials in the matter of plague was to notify the first five cases that occurred to the deputy commissioner and the civil surgeon of their district, and this duty, intended as at least a warning of the incidence of the disease, was neg-

been made. India has now established a Central Research Laboratory in each province, and will doubtless get much good work out of the distinguished officers there engaged. But there is need for a definite and permanent organisation to investigate the subject of epidemics in all parts of the empire, both in their scientific and administrative aspects. To some extent the late Lieut.-Col. Leslie, who in 1904 was appointed Sanitary Commissioner to the Government of India, was doing this for India in addition to his innumerable other duties and anxieties ; many other members of the service, in their several vacations and callings, are engaged in the same pursuit ; our home government has appointed another commission on more scientific lines to shut the stable-door after the horse has bolted ; and there have been many commissions, of many European countries besides our own, which have investigated the plague without as yet having found the final clue to its prevention and extermination. But for a study of this sort, and for practical measures which shall be of use to us throughout the empire, we again feel the need, which will be referred to frequently in this book, of an imperial conception of preventive medicine, and of an imperial organisation to study the causes of epidemic disease and to inaugurate measures to cope with it. The empire needs a general staff for disease as much as for war. So long as we go on nibbling at the cherry, it will always elude us ; so long as we appoint occasional commissions and occasional officials, with a multitude of other duties on their hands, to deal with the question

of one epidemic in one country at one particular time with that epidemic at its height, the question will never be settled. A large well-endowed imperial organisation, with the powers and responsibilities of the War Office or the Admiralty, would undertake the question with a proper sense of proportion ; and, if the government were determined with their assistance to find some way out of the present difficulties, I am convinced that such a body would find it, for the direct benefit of India, and the indirect benefit of science and the whole world.

The commission appointed four years ago, now called an advisory board, is still at work, and has done good work too. But it was a bacteriological commission, which has spent all its time in proving to the hilt the truth of the rat-flea theory of the transmission of bubonic plague, as put forward by M. Simond of the Pasteur Institute in 1898 and proved at least to my satisfaction by Capt. Liston in 1903. This did not require such complete verification ; and no time appears to have been yet spent in the far more important questions as to other possible means of infection.

The mistake made is in the nature and purposes of the commission. What is required is to discover practical measures for the arrest of plague. The present medical staff has its hands full. A special sanitary staff is essential and a considerable expenditure will have to be incurred. The creation of such a staff, its duties and its methods, require the most careful consideration.

A small but strong and independent commission

# DISPOSAL OF SEWAGE.



(a) Bullock-Cart for Removal of Slops.

(b) New Septic Tank for Simla.

Southward from May-Day Hill.

(100ft.  $\times$  9  $\times$  9 $\frac{1}{2}$  deep; from which effluent falls by tippers and perforated trays on to bacterial filter of small granite at the side, 48ft.  $\times$  18  $\times$  8, not here shown.)





## WATER SUPPLY.



(a) A Roadside Well by Dehli.

One yoke of oxen have mounted the inclined way, ready for the next pull, while another yoke on their way down have pulled up the leather mussak, full of water, to the brim.

(b) A Persian Wheel in Lahore.

Within mud wall the unmuzzled, blinkered oxen tread their endless round. And nothing sings of India like the rhythmic moan and creaking of the wooden wheel.

should now be appointed of lay and medical men, experienced in sanitary administration, to build on the foundations laid for them by the present scientific commission and to draw up a practical scheme to deal with the plague. The result would probably be the establishment of a permanent sanitary service of untold benefit directly and indirectly to the Indian people.

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#### FOOTNOTE ON SANITATION

Work specifically against the plague did not exclude, it offered many facilities for, attention to matters of common sanitation. The many notes made on these subjects, while not shaping themselves for a chapter in this book, may be represented by the accompanying Plates 6 and 7.

In the natural conditions of Indian life, heat, light and a porous soil disarm and dispose naturally of excrement, when deposited, as of wont, on open ground. But in village streets, in shaded courtyards and in towns filth accumulates; and there is need for the development of a sanitary service. Europeans use pail closets, emptied without delay by the "sweepers"; at the club in Lahore slops were removed by bullock-cart. At Simla an installation was just completed for bacterial treatment, and it would be of interest to know how far the climatic conditions modify or facilitate as one would expect the septic treatment.

Water-supply must be of the first importance in tropical countries where water-borne diseases, dysentery, cholera and enteric fever are rife, and often devastating in effect. Pains are taken by administrators to secure the surface wells in every village from chance pollution; but the chances of pollution are still obvious. The picturesque method of raising water by bullocks and the Persian wheel is common; distribution takes place with rare exceptions by hand; but water schemes are being gradually adopted for the towns.

## CHAPTER II

### BRITISH RULE AND THE GAMBLE IN LIFE

“As to British Rule, our Government gives security for life and justice; but do the natives care for security? They prefer far more the chance of becoming Vizier one day and being beheaded the next. Under our system they miss their gamble in life.”

We were dining under electric punkahs in a Calcutta hotel on the conclusion of my Indian work. The speaker was a Parsi lady of quality, singularly qualified to understand and estimate the methods and aims of British rule. We were old friends from Oxford days. Her father, an early convert to Christianity, has done sterling work as an Anglican priest. Both she and her brother read law at Oxford and took high degrees. Her brother was now practising as a barrister in Allahabad, lecturing at the college, and bearing the cross in front of the bishop at church festivals, while this Indian Portia, convinced that the Indian people were only waiting for a leader to adopt Christianity, with a softened dogma, wholesale, was intent on protecting the legal rights of Indian women.

The backward state of female education in India and the early age of marriage are proverbial, and

widows of property, unable to bear witness in court except in purdah surrounded by their suite, will often be induced by designing native gentry to sign away their property through ignorance, on blank forms. Portia's scheme proposed that a female official—trained in the law—should be attached to each High Court to take female evidence on commission. A recent visit to England and sympathetic interviews at the India Office induced her to believe her scheme would succeed.

But the great interest due to her scheme was overshadowed by her suggestion as to "the gamble in life." It was one of those staggering *bouleversements* that constitute the charm and value of world-wide travel. Peace and justice, deliverance from plague and famine, education according to European rules, typify the prime ideals of British government. Can they ever be unsound? Are they calculated to make the natives happier, or to fit the country to compete for survival amongst the predominant races of the world? Or is their suitability to India taken for granted and may the presumption be sometimes carried too far?

It would seem that by degrees we are changing our ideas as to the government of dependent races. Lord Curzon's and Lord Minto's viceroyalties have coincided with a very marked effort to assist the better forms of native aspiration, as for instance in the restoration and upkeep of the Taj at Agra, and religious buildings throughout India; in the development of native industry; in the development of native political responsibility and in the higher

education of native rulers. The Cambridge contemporary with whom I travelled out to India, once a prominent member of the old Corinthian football team, had been for six years guardian—one can hardly say tutor—to the young Nawab of Bhawalpur. The Nawab ranks as second only to the Nizam of Hyderabad of all the Mohammedan chiefs in India, and eighth of all Indian native rulers. His tutor's conception of the education required was that befitting an English country gentleman, based on a love of sport and of physical fatigue. The Nawab's minority was at an end, and a few weeks later Lord Curzon installed him as the responsible Governor of his native state. The fear in such a case must ever be lest the privileges of luxury inseparable from native rule get soon the better of the few years' athletic and healthy training. But the training is evidently on the right lines, and the development of the colleges for native chiefs, under Lord Curzon's vigorous and sympathetic control, was a further step in the same direction. In the Aitcheson College at Lahore, for instance, under the presidency of a retired colonel, young native chiefs or junior members of a ruling family were now quartered with their suites within the ample grounds of the institution. Horsemanship was the basis of their athletic education ; for few people will deny that the qualities required for the good polo-player or steeplechase-rider are essential to vigorous rule ; and it is essentially the vigour of government which native rulers lack. The privileges, the pomp and circumstance, the luxury of rulers, are manifest ; shrewdness is not

uncommon ; but vigorous initiative and firm control are lamentably wanting. The defect is historic. Indeed, it was largely owing to the lack of any competent native leader that the Mutiny was suppressed ; for a capable leader, it can hardly be doubted, would have driven the besiegers off the ridge at Dehli, and the conquest of India would have had to have been begun over again. Under modern safeguards, therefore, it is essential for native rule that vigour and individual character shall be stimulated amongst the native chiefs in early life. This will give to Indian administration some of the more fascinating and stimulating qualities to which my Portia refers as “ the gamble in life ”—the chance of a beggar being selected, without examination, for official approval—while guarding against any return of those scenes of atrocity which would now, at least, after a long period of British rule, be both inconceivable and cruel.

The idea of “ the gamble in life ” is suggestive when we pride ourselves on the virtues of British rule. An eminent medical man in the Malay States, a few weeks later in my travel, endorsed this criticism of British rule, from his experience in the West Indies and in the Islands of the Pacific. Spain and Portugal, in his mature opinion, were far ahead of us in colonial methods, at least in so far as the happiness of the people was concerned. In South America there were French, British and Dutch Guiana, side by side, at peace but always in difficulties ; on either side and to the south, Brazil and Venezuela, the products of Portuguese and Spanish colonisation

and till recently the subject of constant revolutions, were progressing soundly and with inhabitants perfectly content. Revolution, we may say, is an unpleasant occupation. But then we do not hail from Venezuela or Brazil; and they who do, so the argument ran, enjoy the excitement of revolution as part of "the gamble in life."

Another chance friend, a British sea-captain at Singapore, after many years' experience in the Dutch Archipelago and the Pacific, was convinced that the Filipinos had formerly been far happier under Spain than they were now under the United States. They, too, had enjoyed their "gamble in life"; and it seemed evident that, in foisting European commercial or military competition on a country—as foisted I believe it must be—and in training the inhabitants to this end by an education and administration on European lines, we must go slowly to work, we must temper the wind to the shorn lamb.

My host in the Malay States made an interesting forecast from fear of the giving out of the tin after ten years. Malaya was enjoying the gamble in life. Seven-tenths of the world's tin came from Malaya; 72,000,000 out of 78,000,000 dollars-worth of their exports were tin; their imports were  $7\frac{1}{2}$  per cent. higher in 1903 than in the previous year, their exports 13 per cent., and it was on this trade that the public revenue mainly depended. The tin, as at present worked, is an alluvial deposit; and, should the alluvial deposit be worked out, it seemed doubtful if the underground mines of gold and other

minerals, then being explored, would be able to keep up the revenues. If not, Malaya would gradually revert to an agricultural country, and would have to depend for revenue on the success of rubber and coffee. These crops were in consequence being planted right and left in places where jungle had been cleared away by axe and by fire. With the extraordinary recent advance in the demand for rubber, this prospect draws near. Malaya will have profited by her gamble. But it is in any case questionable whether it is not far better to develop the natural resources of a country slowly than to trust to an industrious and usually imported community, produced by rapid development, to discover new sources of revenue. In other words, it is suggested that "the gamble in life" be allowed to die a natural rather than a violent death.

We are inclined to laugh at the experience of Dutch administration in the East Indies. The Achinese were still, when I last heard of them, at war with the Dutch. The war had lasted twenty-eight years, scarcely a single expedition from headquarters had ever returned successful, and not a few may be said never to have returned at all. This need not be due to sheer weakness of the parental government; it may equally be due to an instinctive if unconscious principle that, although the East Indies be coloured Dutch on the map, it is wisest to leave the Achinese by degrees to conform to the new authority.

Is the British rule of "inferior" races the best? According to European ideals, it is by far the best that the world has yet seen. A medical missionary

passing through Mombasa on his way to Lake Nyasa, was immensely struck by the difference it showed between German and British methods. Along the sea-front he described a magnificent row of commercial and official buildings in permanent material, with the German flag waving overhead and German sentries smartly pacing the ground down below ; but behind the sea-front there was not a sign of the German invasion. The Germans, it would seem, would wish to impose their military system, complete and unchanged, on their East African possession ; but they have little or no desire to permeate the country or by degrees to imbue it with the ideas which are the necessary preliminary to the acceptance by races of small intelligence or culture of modern rule on Western lines. The same, I am confidently informed, is the case in German South-West Africa ; the same appears to have been the cause of the trouble in the Shantung Province of China, which led to the Boxer outbreak ; the same was the cause of the Opium War, for which we must be held to have been largely responsible ; and indeed the same has been a common experience amongst all colonising nations. If it be sought to make a colony immediately self-supporting, above all with an extravagant officialdom and expensive show of administration, the natives have to be taxed for what they do not want ; and, if there is any vigour of organisation amongst them, the natural result is revolt—they prefer “ the gamble in life.”

Our own greater success—for, after many centuries of experience with many set-backs, we are entitled to

call it success—is due perhaps to the fact that we yield a good deal to native feeling, we leave the burden of rule so far as is possible on native shoulders ; we let the gamble go on—under supervision. An instance occurred in the Plague Regulations issued by the Punjab Government in 1903. The only compulsory duty on local authorities in respect to plague was to notify to the deputy commissioner and the civil surgeon of the district the first five cases that occurred. The infringement even of this sole duty was never to my knowledge in any way punished ; and infringement, to my knowledge, under inexcusable circumstances, was frequent, and most serious in its results. All else was optional. “Let the people die,” said the government, in effect. “They look upon it only as a visitation of God. We suffer no discredit, and a policy of masterly inactivity is both easy and cheap.” No doubt a policy proposed from their laboratory stools by many scientists in Berlin, Paris and London would have led, as it did lead in Poona, to native risings and serious discontent. But a more definite policy with regard to the plague might with advantage have been adopted ; it is one of many instances of British yielding to native feeling in the hope that, as has been said in another connection, we may muddle through somehow.

It is easy to multiply examples of this principle. In India we see it, for instance, in the freedom allowed to the National Congress and to the remarkably feeble native Press ; in Natal our partial adaptation of native Zulu law, our institution of

special courts for dealing with native cases, our maintenance of various tribal customs, are remarkable. The position reached by the Maoris in New Zealand and by the negroes in the West Indies is evidence of the effect attained in many generations by sympathetic attention to the real native needs. Finally, our tolerance of native religion in all the five continents is proverbial. We have done our best, in some cases at least, to lend support to "the gamble in life."

But at the same time we must not give in to a false sympathy with such native customs and prejudices as, whether right or wrong from the native standpoint, are a direct obstacle to the extension of our effective rule; nor must we on the other hand so transfer our feelings to the persons of the subject races, with whom we sympathise, by imagining that they feel as we should feel under similar circumstances. An instance in point is the abolition of slavery. No doubt there was much oppression and cruelty, and as to the need of suppressing the slave trade as it existed—and unfortunately still exists in Central Africa—there can be no two opinions. But looking back on the system of slavery, and comparing it with the condition of liberated slaves and their descendants, there can equally be no doubt that many slaves were happier in their slavery than they now are in their freedom. It is absurd to imagine that any intelligent slave-owner would wilfully damage, still less kill, the slaves in his possession. A slave was a valuable asset; as a master cares for his horse or his motor car nowadays, so he

would naturally be careful of the well-being of his slave. Ignorance and brutality might well be guarded against by a proper system of inspection and organised philanthropy, as is usual now in the more civilised lands for animals and children. The government might then have been saved the discredit of having thrown a large body of innocent helpless creatures upon the mercies of a hard world, with which upon their own initiative they were quite unprepared to cope. Moreover, a large proportion of slaves, kept under good conditions, would prefer a state of slavery, if only for the sake of the larger stake it offers in "the gamble of life."

A false, although not to my mind excessive, sympathy was thus recently displayed for the Chinese coolie. Those who declaimed against the Chinese importation to South Africa should have paid a visit to Singapore, taken steamer to Port Swettenham, and trained up through thirty miles of jungle to Kuála Lumpúr, the capital of the Federated Malay States. The little single line, cut through the dense forest, emerges suddenly upon a wide clearing and here is a model town, rich in fine buildings, alive with official and commercial activity, and humming with prosperity. Of its 32,000 inhabitants, 23,000 were Chinese, the descendants of Chinese imported labour. Selemban, the capital of Negri Sembilan next door, was a similar instance of the extraordinary prosperity directly due to the imported labour, and just before my visit 7000 labourers had been imported by a Chinese contractor. No one could say that these labourers were discontented or troublesome, or that

they were badly paid, or that the country had not been developed to a most astonishing extent and with astonishing rapidity owing to their work ; while the prosperity of the most successful Chinese merchants, many of whom started life as coolies and now have palatial mansions in Penang, was the most complete answer to the denunciation of the institution of a similar system in South Africa on any humane grounds. To those whose ideal, regardless of the end, is progress and development—two very popular catch-words—Chinese labour has been the saving feature in Malaya. But it is a question for statesmen whether the Malay States or the Malays or the world have gained by this progress and development.

The first batch of Chinese coolies for the Transvaal sailed from Hong-Kong in high spirits a day or two after my arrival ; and later on a visit to Tien-tsin enabled me, in company with an Oxford Fellow, who was organising the experiment in China on behalf of the Transvaal Chamber of Mines, to call at Li Hung Chang's workhouse, and see the material from which the second batch were drawn. No system ever conceived by General Booth for emigration and employment of the workless could claim a greater right to sympathy from the philanthropist. Again be it repeated, Let us beware of false sympathy with picturesque versions of native feeling.

Our rule succeeds in comparison with that of other European states because we give considerable tether to those whom we rule ; but at the same time our rule also succeeds because we insist on certain definite principles. The day before my arrival on a

visit to Peshawar, a Ghazi had tried to shoot a colonel at point-blank range from behind, on the railway platform. Fortunately the pistol missed fire. Now, had a too sympathetic or inactive administrator been in power at Peshawar, some days would have elapsed before the culprit had been brought to justice, and his fame meanwhile would have gone round all the neighbouring hill tribes. But the late Colonel Deane was no milk-and-water administrator of the North-West Frontier Province. A properly constituted court was assembled before twenty-four hours had elapsed ; the prisoner was fairly tried, condemned to death and hanged ; and by the time the hill tribes had heard of his fanatical deed they had also heard that the British power had vindicated its authority.

A few clear principles appear to have been evolved. Cruelty, in whatever form, must be suppressed ; and, however closely it be allied with the ritual of religion, a firm and determined attitude towards it by the central government soon extinguishes it without disturbance, where half-hearted measures might provoke dissatisfaction, if not a mutiny. Jagernath no longer crushes thousands to death beneath his triumphal car, and widows are no longer allowed to submit themselves to the rite of *sati* and perish on the funeral pyres of their husbands. But at the same time we temper our determined attitude in such instances by a policy of absolute indifference in cases where no such cruelty exists, as for instance in such ceremonies as the tribal rites of circumcision among the natives in British Kaffraria and the

aborigines of Australasia. Vigorous administration is no bar to peaceful government—indeed, it is a guarantee. Our Foreign Office rightly protects our missionaries, who represent to the coloured races an essential aspect of the European power, however much the European public would often willingly disown it. Stringent liquor laws also are an acknowledged essential in the treatment of uneducated races ; and again I would say that a bold policy in connection with the plague in India would have been better than all the half-measures with which it has been confronted, far better than the executive indifference with which it was met in the winter of 1903-1904. Half-policies are of the devil ; a vigorous rule is what native races require, and some remains of “the gamble in life.”

## CHAPTER III

### THE MAD DOG

*History of the Pasteur Institute of India.*—The Pasteur Institute at Kasauli is an institution of remarkable value, recently established under the patronage of the Indian government, although an independent concern. The tale of its foundation is amusing and instructive. It was told me by the Director-General of the Indian Medical Service, himself president of the committee of management, in a walk one morning before breakfast round Jakko, the monkey-haunted hill at Simla. The number of bites from mad dogs and jackals throughout India is considerable. Death from hydrophobia (rabies, *la rage*) is a painful process, besides causing in the case of a soldier a definite economic loss to the Indian army. For both reasons the Indian government felt bound to give the sufferers relief according to M. Pasteur's treatment. But in order that this treatment should be effective, cases have to be treated as early as possible, and in any case before active symptoms of hydrophobia appear. Up to a few years ago the only place where this treatment could be carried out was at the Pasteur Institute in Paris, and so to Paris all who had been bitten by mad dogs or jackals were sent. Each man thus sent cost the Indian government £100.

Now, it was difficult to say whether the bite was from a dog infected with hydrophobia or from one which was merely vicious or irritated. In some cases, of course, the subsequent history of others who had been bitten by the same dog, or the subsequent illness and death of the dog itself, was a guarantee that the danger was real. In some cases bacterial examination, or inoculation of healthy rabbits from solutions of the infected brain, producing death in the rabbit with definite hydrophobic symptoms, proved sufficient. And so the government required that the animal, alive or dead, or at least its head, should be sent to a laboratory for examination. But supposing the dog or the jackal refused to be caught, supposing the bite was inflicted on a dark night, or in a crowd, or in out-of-the-way jungle, no such evidence would be forthcoming ; and it became necessary to take general evidence as to the truth of the victim's story.

But the journey to Paris at the expense of a humane government was no infliction on the private soldier ; indeed, he enjoyed it. He enjoyed leaving a tropical climate for one to which he was accustomed, he enjoyed getting away from Indian surroundings to a city of white people, he enjoyed the freedom from work and, above all, he enjoyed, on completion of the treatment, his return to the regimental dépôt in England, his place in the battalion having meanwhile been filled by a recruit fresh out from home. It therefore became a definite object to be suspected of having been bitten by a mad dog or jackal, and to be sent to Paris with this

provisional diagnosis. Tommy Atkins would present himself to the regimental medical officer, showing a wound on his forearm or shin, with a yarn about a mad dog which had bitten him and several natives, but had escaped before they could catch it. Natives and dog would naturally enough escape identification, and in the resulting doubt Atkins secured the benefit and was shipped off westward. After a time the doctors had their suspicions aroused, and took to examining the bite with a hand-glass, by which they were able often to find that the wound was no bite, but merely a scratch or cut, perhaps intentionally inflicted. Atkins, however, was equal to the occasion, and a machine was actually discovered in barracks, consisting of a dog's jaw mounted on a strong spring, for inflicting a wound which could not by any means be proved to have been inflicted otherwise than by a dog's teeth.

The bill for sending soldiers to the Pasteur Institute meanwhile rose higher every year, and so the government decided to support a Pasteur Institute of their own. But inasmuch as inoculation of rabbits with the poison is an essential part of the process of preparation of the vaccine, and inasmuch as such inoculation of animals is a cause of indignation to anti-vivisectors, it was decided that this should be a private institution, to which the government of course subscribed a round sum in payment for the benefit they received from it, as they had previously paid £100 for every case sent off to Paris. The Director-General of the Indian

Medical Service presided over the fortunes of this institution, in a private, not in a public capacity, and for the directorship India was fortunate enough to secure the services of Colonel (now Sir David) Semple, one of the best scientific workers in the Royal Army Medical Corps, whose reputation for sound scientific work has been increasing yearly since its reorganisation. As director of the institute, Colonel Semple had first worked at the Pasteur Institute in Paris, thus becoming fully conversant with the methods employed both in the treatment of hydrophobia and in general medical research and bacteriology. A visit to Kasauli on the way down from Simla to Lahore amply repaid the discomfort of a couple of nights in the dark and dismal native-managed hotel.

*Situation.*—The site in itself is admirable. In choosing the site for such a laboratory in India it is necessary in the first place to choose a hill station. For on the one hand high temperatures cause all sorts of bacteria to flourish when they are not required, and in other ways interfere with the bacteriological work, even when an ample supply of ice is forthcoming—a considerable addition to the expense of the institution. On the other hand the confined and exhausting work of research, much of it consisting of detailed observation through the microscope, is severe enough of itself for any human being under the most favourable circumstances—I hate it myself, even at home. And with a temperature of 120 degrees in the shade it is cruelty to expect any consistent work in a laboratory, or the development of any original

ideas in research. In the second place, it is necessary that the site shall be as central for purposes of communication as possible.

Kasauli is on the very southernmost margin of the series of hills, leading up 40 miles on to Simla and 200 miles on again to the summit of the Himalayas. It is of itself 6000 feet above the sea, while a precipitous descent of 9 miles brought us to Kalka, 35 miles from the large cantonment of Ambala, right down in the plains. From the rocky crags and the best situated bungalows at Kasauli, the view south and west, at sunset especially, was magnificent. A dense mist hovered over the plain so many thousand feet below ; at intervals the winding, twisting Sutlej reflected up mirror-like the ruddy rays of the setting sun, while behind us rose ridge after ridge covered in green, with a distant glimpse of Simla and the snow-shrouded range that screened us off from China and Thibet. Here were stationed during the hot weather a couple of European regiments and all their camp-followers. Here was the army school of signalling. Here, year in and year out, were established Colonel Semple and his little knot of workers, opening the doors of their institute daily to Europeans and natives supposed to be in danger of hydrophobia, from all parts of India, Burmah and Ceylon.

*Administration.* — The real scientific research worker is a distinct breed of mankind, and Colonel Semple is one of them, to whom the whole interest of life, hourly and daily, both in the present and in the future, consists of research, and the welfare of

the institution and of the administration that supports it. At the same time his training in a royal corps of his Majesty's service has made him a good organiser and an efficient and practical man, ready at all times to devise new methods, to review his tenets in every fresh light, and to make the best of what knowledge and means are in his power. The whole place, even then in its third year, was a model of scientific virtue and should convince any government and any philanthropist of the advantage to be gained by encouraging research. The Institute itself is a capacious one-floored bungalow, originally a private residence, opened for this purpose on the 9th of August 1900. It receives from government 1000 rupees a month, or £800 a year, instead of their having to pay £100 for any soldier or his wife or child to be sent to Paris. Few malingerers care to come to Kasauli, for the treatment is, in anticipation, a considerable and useful, though actually harmless, deterrent. Even apart from the malingerers, the Indian government thus secured the treatment of 161 persons belonging to the British army in the year 1902-1903, which would have cost them under the old regime over £16,000. This year, for their £800 inclusive subscription, they secured the treatment not only of these 161, but also of 100 other Europeans, of 36 of the native army, and of 240 native civilians—a saving, in other words, of much suffering, of many deaths, and of £15,200.

The animals that inflicted the bites in the 584 cases scheduled for the year included sixty jackals, three cats, one mule and one fox, besides a man who

by his saliva infected 10 persons at Quetta ; all the other cases were caused by dog-bites.

*Hydrophobia : Principle of Treatment.*—The principle of the treatment reads like a detective story. The poison spreads not by the blood, but slowly, day by day, along the nerves up to the spinal cord, and so to the brain. It there takes fourteen days to establish itself before causing any symptoms. Thus in the laboratory, if a rabbit be infected with a dose of the poison directly on its brain, symptoms occur in fourteen days, whereas after a bite on hand or foot symptoms do not occur for sixty days or more ; it takes seven weeks, in other words, for the poison to travel from hand or foot up to the brain, and a fortnight more before it will cause any symptoms. The object of treatment is to raise the power of resistance to a maximum before the poison reaches the brain centres. It is a race between burglar and policeman—if inoculation is in time to protect the brain before the poison gets there, all mischief is prevented ; if the poison gets there first, death may be the result.

The poison is almost certainly due to a microbe, and when we find the microbe, and are able to cultivate him, it will presumably be best to inject the culture pure and simple. At present we have not found the microbe ; so we take an extract that must contain him from the brain of an animal that has died of hydrophobia and breed him in the brain and spinal cord of a live rabbit in the laboratory. After death we hang the rabbit's brain and spinal cord up

to dry, for the poison to lose its power ; at different stages of this weakening process we make mincemeat of the brain and spinal cord and the poison they contain, and then inject this varied mixture into the anxious patient.

*Preparation of Anti-rabic Vaccine.*—The manufacture of the material to be injected is also of great interest. The method is that originally described by Pasteur, with a few modifications. Pasteur found that, when the spinal cords of animals thus killed were hung up to dry, the poison contained in them first gained and then gradually lost in power ; on the third day it reached its maximum of virulence, on the seventeenth day it was entirely innocent. By injecting first of all a solution of infected spinal cord that has hung for seventeen days, then cord that has hung for sixteen, fifteen, fourteen days, and so on until the patient is able to tolerate the injection of cord that has hung only three days, no untoward effects whatever are noticed, and the patient is able to cope with any poison that may then reach his brain centres. But this spinal cord prepared in the laboratory—this medicine, as we may consider it—varies in strength according to the animal from which it has been prepared, and Pasteur therefore made a further most valuable discovery when he found that, by injecting the poison from any hydrophobic animal into a rabbit, and from that rabbit after death into another, and so on in succession, the poison grows in virulence until it at last reaches a definite standard, known as “ Pasteur’s fixed virus ” or rabies vaccine, which

produces its first sign of disease in a rabbit on the seventh day, and death on the tenth or eleventh.

With this fixed virus you start your anti-rabic institute and treatment. To prepare a stock of the vaccine of different strengths, the spinal cords are removed from rabbits that have died from inoculation with this fixed virus. For this purpose the rabbits after death are trephined, and the whole spinal cord quickly and aseptically removed. The cords are then divided up the middle, and each half suspended on silk in sterile stoppered glass jars containing enough solid caustic potash to dry them at least twice over. At the same time a tube of sterile meat broth is "inoculated" from the surface of the cord; any pollution of the cord would show a visible growth of bacteria in this broth in a few days; the absence of any bacterial growth within three days shows that the cord was not contaminated by other infection. At the same time also an emulsion from the brain of the dead rabbit is inoculated into a fresh rabbit to keep up the series, this being done on successive days. Colonel Semple was able to show me a row of bottles containing third-day cord, fourth-day cord, fifth-day cord, and so on up to fourteenth-day cord.

It is a question whether the virulence or the quantity of the poison is diminished while these cords are hung up to dry. A professor at Buda-Pesth says it is the amount of poison that is diminished, and that he gets equally good results by injecting doses of three-day cord in diminishing dilution and increasing quantity. If this were established, anti-rabic work would be immensely simplified and would become

available in every bacteriological laboratory, instead of in elaborate institutes only.

The inoculation of the rabbits is performed under chloroform. A neat midget trephine removes a small bony disc from the skull; the needle of the syringe is inserted direct into the brain; the scalp wound is left to heal up, as it does perfectly well within a few days; and the rabbit is immediately returned asleep to its cage, the whole operation taking perhaps three minutes. Dr. Kitasato, in Japan, on the other hand, in his research laboratory in Tokyo, does not even trephine, but injects the poison directly, under chloroform, by a needle of the precisely requisite length, along the side of the eye and optic nerve, through the optic foramen into the brain. This method seems astonishingly simple and ingenious, but I must confess that the first rabbit I saw thus treated died on the spot, all attempts at artificial respiration proving useless.

The difficulty of conducting such treatment in this institute may well be imagined, for the virulence of the cords decreases daily, and on any one day arrangements may have to be made—as, for instance, on the day of my visit—for thirty-six doses of all degrees of virulence—so many of third-day cord, so many of fourth, so many of seventh, and so on. Two rabbits were inoculated for the purpose of preparing virus every day, however few patients there might be in the institute. The cord, which is used within the first three days to supply fixed virus, is depended on to supply virus on each successive day, of diminishing virulence, until it has all been

used by the end of the fourteenth day. Should both the rabbits inoculated on any day die, or their cords after death become contaminated at any stage between the inoculation and the attainment of the standard of virulence for which the cords are to be used, the gap in the treatment of all patients is definite and irreparable.

Extreme care has therefore to be taken in the drying-room, in which the cords are kept at a uniform temperature, at a uniform degree of moisture of the atmosphere and devoid of all light, the walls and ceiling being papered in black ; for moisture, light and heat are all disturbing elements.

For each dose half-an-inch of the cord is cut off with sterile scissors and mashed up with a teaspoonful of salt (normal saline) solution, being used one day as third-day cord, the next as fourth-day cord and so on.

*Course of the Treatment.*—When a patient arrives at the institute he is seen by the director, and is ordered treatment according to the intensity and presumed danger of his case. In ordinary cases it will be as follows :—1st day, an injection of fourteenth-day cord ; 2nd day, thirteenth-day cord in the morning and twelfth-day cord in the evening ; 3rd day, eleventh and tenth day cords ; 4th day, ninth and eighth ; and, on successive days, seventh, sixth, fifth, fourth, and third day cord respectively ; then, on the 11th day, back to seventh and sixth day cords, and, on successive days, fifth, fourth and third ; on the 15th day again, sixth and fifth day cords ; then fourth and third ; on the 18th day, sixth and fifth ;

and, if necessary, fourth and third day cords on the 19th and 20th days, to end up with. By this time the patient is thoroughly immune against infection. But if the poison has reached the brain even only a day before this the immunity may be too late. The poison takes fourteen days to produce signs of the disease ; so it is not till fourteen or fifteen days later that the danger is over, five weeks in all from the beginning of the full course of treatment.

In the worst cases an intensive form of treatment is adopted, working up to third-day cord as quickly as the patient can bear ; and in these it is an exciting but anxious task to look out for any signs of hydrophobia, that may show that the treatment has been too late, or any signs that may show that the treatment has been pushed forward too rapidly. Should signs of the disease occur during the course of the treatment or within fourteen days of its completion, plus one which must be allowed for the injection to take effect, the poison must have reached the patient's brain centres before they were up to full three-day cord immunity—that is, he came to the institute too late, and his case therefore is not counted in the statistics given on page 78 as a failure. Of these cases there were six in the year under consideration, four of whom developed symptoms during treatment and two within a fortnight of its completion. Of absolute failures, despite treatment, we have seen that there were only six, a proportion of 1·02 per cent. The larger and more ragged the bite, or the nearer it is to the brain, the greater will be the chance of rapid infection and the need of prompt treatment.





### The Verandah at Kasauli.

Patients from all India, waiting for the daily prick of the needle, to save them, thanks to vivisection, from the most awful of deaths.

It was interesting to pass from the laboratories into the consulting-room, to see all the doses standing ready in little glass dishes on a side table, labelled for the patients for whom they were severally destined ; to watch the process of injection, the dipping of a needle into carbolic oil and the plunging of it into the skin of the flank, a practically painless operation, over in less than a minute. But the greatest interest of all was in wandering out on to the verandah, to see the variety of patients assembled for their morning dose—half-a-dozen British soldiers in khaki, sent over from Burmah, where they had all been bitten by the same dog ; a sergeant's wife from Rawal Pindi ; a clerk from the offices at Madras ; a couple of Sikhs in flowing garments, with their beards twisted up into the long hair knotted under their turbans ; a Parsi from Poona, and his fat little boy, dressed in garish colours ; a fakir in a loincloth, his body smeared over with dried clay and his hair knotted and matted with dirt (Plate 8).

Is not this the very essence of a modern paternal government ? Is it not one of the strongest factors in securing our rightful position of responsibility over the uneducated, childlike, helpless races of India ?

*Antitoxin.*—Colonel Semple was trying to produce a satisfactory anti-rabic serum—to develop, in other words, and to employ for treatment, the natural antidote, whatever it may be, by which under certain circumstances a living animal may resist the poison of rabies. This would obviously be a far more certain method than that of vaccination just described.

The present method seeks only to train the brain tissues, by gradual inoculation of the poison in increasing doses, to produce the natural antitoxin and so resist the poison from the bite, if the poison from the bite shall not have gone there first. The proposed method would mean the inoculation of the actual antidote, which could act on the brain centres even after they had become affected. By the new method ponies were being trained to manufacture antitoxin by being inoculated, as the patients at the institute were being inoculated, with increasing doses of the poison. The healthy little pony I saw being inoculated with blinkers on, to which process he showed no objection (Plate 9, p. 82), was now after seven months able to stand so large a dose of fixed virus as would have killed him, seven months before, six thousand times over. After eight months the ponies were able to stand the amount of virus contained in the whole fresh brains of two rabbits, dead from the acutest form of the poison. A fortnight later some of the pony's blood would be drawn off, and tested in a test-tube against the strongest form of rabies poison, inoculation with this mixture of poison and antidote being found, when properly mixed, to produce no symptoms on inoculation into rabbits. Considering the proved value of the treatment already in force, in Paris, in Kasauli and elsewhere, Colonel Semple did not dare to experiment with his new method on human beings in the place of the old method, but he used it as a preliminary to the usual methods in badly bitten and late cases, thus giving the patient, it is supposed, an antidote to ward off

the attacks of the poison, until by the usual methods the patient's brain centres should be sufficiently immunised to resist the poison of their own accord. Before long it is hoped that this serum may have proved its value; then it will be distributed like diphtheria antitoxin or any other medicine to all parts of the earth where there is danger of hydrophobia. With ordinary care it may be kept and inoculated by any medical practitioner, and many cases which are unable to reach a duly established Pasteur Institute will thus be saved from death. Surely the value of a research institute was never so clearly proved.

*Results.*—As regards results, the patients at Kasauli are classified as follows:—Class A., those bitten by animals proved either experimentally or by the development of the disease in other persons or other animals bitten by them to have had rabies; Class B., those bitten by animals certified by a veterinary surgeon to have had rabies, after examination before or after death or both; and Class C., those bitten by animals suspected of rabies—in other words, the certain, the probable, and the possible cases. Each of these classes is again divided into three sub-classes, according as they are bitten, (1) on the head or face; (2) through the exposed skin on any other part of the body; (3) through the clothing—in other words, the most dangerous, the medium, and the least dangerous form of bite. In the year before my visit, 62 certain cases amongst Europeans had been treated, 43 probable,

and 164 possible, giving a total of 269 European cases, without one failure ; while at the same time 42 certain cases amongst natives, 27 probable, and 246 possible, or 315 native cases in all, had been treated, and of these there were only 6 failures ; giving a percentage of 1·9. These 6 failures were merely suspected cases ; 2 had been bitten on the head or face, and 4 on exposed skin elsewhere. Bites through the clothing, it will be noted, are not very dangerous, for the teeth which do the deed are wiped clean of the poison in their passage through the clothes.

So again in the previous year, there were no failures out of 215 Europeans treated, while the 7 failures out of 328 natives treated were in cases in which the bite was of the more dangerous kind. There are many obvious reasons to account for this racial difference. The Europeans were less severely bitten ; their wounds were more promptly and better treated immediately after the bite ; they reached Kasauli usually at an earlier stage for treatment ; being healthier and stronger in themselves, and better fed before, during, and after immunisation, they were enabled to offer more resistance to the infection that may have been in them. The small proportion of patients classed as bitten by animals proved rabid is illustrative of the difficulties of tropical work. For if the brain or spinal cord, on which the diagnosis was to depend, were sent improperly preserved, it would arrive putrid, and injection of its juices into a rabbit would cause death from blood-poisoning before there was time to wait the fortnight for

hydrophobia to develop. If, on the other hand, the specimen were sent in spirit, the spirit would destroy the virus of rabies and injection would in any case cause no disease. To preserve the specimen in ice is not always convenient in a warm climate, and the only certain method is to preserve it for its journey to the hills in sterile neutral glycerine.

Under these circumstances, doubt may occur whether the results recorded do not give a fictitious idea of the value of the treatment ; for a considerable number of the patients treated would not presumably have developed rabies in any case. But the doubters may be pretty certain that the journey to Kasauli and all the discomfort and expense it entailed were not undertaken without really good reason for believing that the bites had been inflicted by rabid animals ; and it will be seen that one-third of all cases were actually proved genuine by the animal before death, or the extract of its brain after death, causing death in other animals either in the laboratory or in the streets of the place whence the patient had come. Then it may be suggested that the number of failures is quite understated ; the report, for instance, for 1903 corrects the report for 1902 by giving 2 deaths, respectively three months and six months after the completion of treatment. But it is improbable that there are many such omissions ; for every patient on leaving Kasauli is given a stamped and addressed postcard, which he is to send up to the institute three months later, giving a general account of his health, and, on the receipt of these cards, fresh cards are sent, and so on

until all danger is over. One might expect that in the result few of these cards would be returned, but in point of fact they are all returned. I suppose the village *munshi* or the schoolmaster does the writing for the illiterate native.

I have often wanted to have this system of information as to after-results adopted in the big London hospitals, but the difficulties when the idea has been mooted have been considered too great. Here, however, is an instance of its success under far more difficult circumstances.

A further fallacy is avoided in that twenty persons in one year and ten persons in the next were not treated, and are not reckoned in the above numbers, as their information seemed to show that the treatment was unnecessary.

*Smallpox Vaccine.*—But the value of the Kasauli Institute does not end here. One department is engaged in the preparation of smallpox vaccine for the whole of the Punjab, and vaccine is a medicine given to the people by the government which they fully appreciate as an almost complete preventive against a disease which in India is so great a scourge. This vaccine is now sent out, according to improved modern theory, preserved in glycerine, which kills off any contaminating germs within a fortnight ; or, if urgently required, it is sent out in chloroform, which kills off contaminating germs at once ; so that, on receipt of an order for lymph on Monday morning, a calf can be at once inoculated, and sixth-day lymph sent out ready for use on Saturday. One interesting

difficulty is that of caste, the Hindus down in Mysore, although not those in the Punjab, objecting to the use of the sacred calf for the preparation of vaccine. But the buffalo is not sacred, and vaccine is therefore prepared for these conscientious objectors from the buffalo calf, the only difficulty being that the lymph in the buffalo deteriorates in its passage in inoculation from one to another, and its virulence must be raised after every third passage by passing it through a child or a calf.

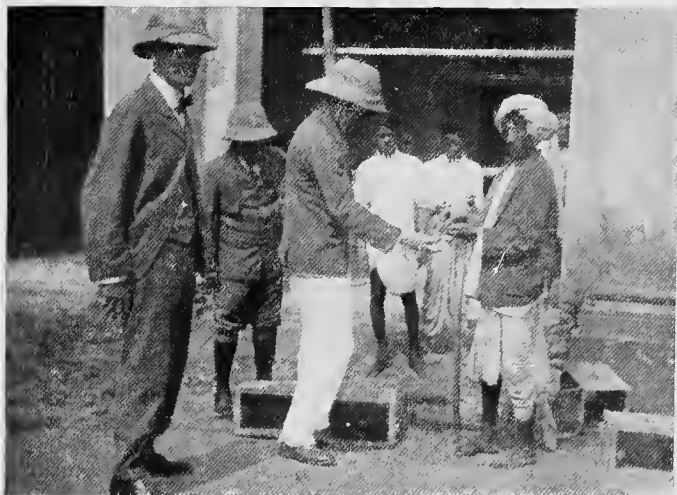
The buffalo, as I have said, is not a sacred animal ; it is one of the ugliest of beasts ; and the story of its creation in Hindu folk-lore fully explains its appearance and its non-sanctity. For Adam, the first of men, looked out upon God's creation, and saw how beautiful were the animals that the Almighty had created. " Let me also create an animal," he implored the Almighty. The Almighty granted his request, and the result is the buffalo.

*Snake-venom.*—Hydrophobia and smallpox are the two diseases that occupy most of the attention at Kasauli, but a most important branch of research work was being carried out by Captain Lamb, of the Indian Medical Service, on the subject of snake-poisons.<sup>1</sup> These poisons are of two distinct and separate kinds, the one derived from the cobra, the other from Russell's viper. By laborious research

<sup>1</sup> Unfortunately, as these pages go to press, news comes of the untimely death of Major (then Captain) Lamb, by which India and indeed the whole world are deprived of one of the most capable and effective research workers in preventive medicine.

an anti-venomous serum has been produced for each of these poisons, an antidote produced by the gradual inoculation of ponies with the respective venom. The advance in knowledge in this subject has occurred simultaneously under Captain Lamb at Kasauli and under M. Calmette at Lille. The anti-venenin, as it is called, which was prepared at Kasauli neutralised, dose for dose, half as much again of cobra-venom as that prepared at Lille.

The method of collecting snake-poison, for the purpose of immunising the ponies and preparing the antidote, is as interesting to the spectator as it appears to be dangerous. The process was shown me at Professor Haffkine's laboratory, belonging to the Bombay government, a few miles out of that city, at Parel. The snakes are kept in Huntley & Palmer's biscuit-tins, covered in by fine rabbit-netting in the place of a lid, and are under the charge of the cleverest snake-charmer in India, retained for the purpose at what to the native is the princely salary of 25 rupees a month, or £20 a year all told (Plate 9). The cobras are milked, as it is called, once every seven or ten days. They are turned out at the end of this fast one at a time from their tins, the neck pinned down by the charmer with the end of his stick and the tail by his bare foot. He then seizes them behind their jaws between his finger and thumb, while an assistant holds a sherry-glass, covered with American cloth, through which the cobra plunges his fangs—the fangs on the upper jaw, about in the site of our canine teeth, the cobra's one-sixth of an inch and the viper's half-an-inch long.—As



(a) The Colonel Injects enough Poison to Kill 6,000 Ponies (*p.* 76)

(b) Milking a Cobra at Parel (*p.* 82).



the fangs moult, one is able to procure specimens.—The snake having bitten into the American cloth, a bright yellow, clear liquid, about half a teaspoonful, escapes into the glass, and in a few hours crystallises out. The cobra is fed through a glass thistle-shaped funnel, thrust down his throat, with a quarter of a pint of egg-and-milk mixture, and is finally returned to his tin for another week or ten days, until he is hungry enough to bite again. In this way the snakes live for about eighteen months. The poison of Russell's viper is extraordinarily virulent; one grain of it in the jugular vein will kill a horse in fifteen minutes. It acts on the blood, causing rapid coagulation, whereas the cobra poison acts on the central nervous system. The new snake-house at Kasauli is a model lodging-house for snakes, with a series of cells covered and fronted in glass, properly ventilated and easily cleaned, raised on a shelf at a convenient height above the ground, in a hothouse kept under proper-conditions of temperature and moisture.

*Anthrax or Splenic Fever.*—It would be impossible to give in detail an account of the work in other departments at Kasauli. Mention has been made of work in connection with hydrophobia, smallpox, and snake-bite, but much was being done in the preparation of a vaccine against anthrax. Anthrax or splenic fever is a great scourge in many civilised countries; it is still more of a scourge in India. Statistics in France show that the mortality amongst sheep in districts where anthrax is prevalent was reduced by inoculation from 10 to 1 per cent., and

amongst cattle from 5 to  $\frac{1}{3}$  per cent. The preparation of vaccine at Kasauli was in 1903 in its infancy, but before long it was expected that it would do much useful work. The value of anthrax vaccine was of course recognised and put into action in Japan during the recent war. At a visit to Dr. Kitasato's laboratory in Tokyo I found that the twenty-five-thousandth dose of anthrax vaccine had just been completed. Every horse going out to the war was injected twice, at intervals of ten to twelve days. An attack of splenic fever amongst the limited number of horses in the Japanese cavalry would have been a fatal calamity. The government, however, were forewarned, and, unlike some European governments, being forewarned took good care to be forearmed.

*Lockjaw.*—The same activity was being shown at Kasauli in the preparation of an antitoxin against tetanus or lockjaw, and the horses used in its preparation were already in a fairly advanced stage of immunity. This discovery again had been put into practical use in Tokyo by Kitasato, who, with Von Behring, discovered the antitoxin in Berlin in 1895. In the wear and tear of the campaign in Manchuria horses would be wounded, and there would surely be danger of the wounds being infected by tetanus. An ample supply was therefore prepared in good time, and sent out to the seat of war. One may wonder if on the Russian side any such foresight was shown. In South Africa, certainly, no steps whatever were conceived against such a mere possibility.

*Other Laboratory Work.*—At Kasauli also a diphtheria antitoxin was being prepared. Two strains of diphtheria obtained from Calcutta had been found defective, but a virulent culture had been obtained from England (*pace* the customs officers), and horses were being immunised from this source.

Typhoid vaccine had also been prepared, and two thousand doses sent out in five months. An antitoxin against blood-poisoning had been produced. Researches had been undertaken in connection with cerebro-spinal fever, plague and malaria, and samples of blood and other material from different parts of India examined for malaria, tubercle, bilharzia and the diseases already mentioned. Samples of water had also been examined in connection with water-supplies.

*Pamphleteering.*—Not less striking were the pamphlets prepared by the director for issue in connection with his various vaccines and antitoxic fluids. Scientific men working in laboratories do not as a rule sufficiently realise the importance of explaining their methods to those who must use them and to those on whom they are to be used. Pamphlets issued from the Pasteur Institute of India gave full descriptions, for instance, of vaccination against typhoid fever, of the principles upon which it is based, the composition of the vaccine, the methods to be employed in the injection, the clinical symptoms that may be expected to ensue, the advisability of a second inoculation, the signs and limits of its success, and suggestions as to preservation of the

vaccine and the keeping of records for statistical purposes. The pamphlet was essentially prepared for the use of medical men, and through them could be readily interpreted as required to their patients. A similar four-page pamphlet described the process of vaccination against anthrax ; another the use of serum against snake-bites ; a fourth gave directions for collecting and sending specimens of material for diagnosis ; a fifth gave information as to the treatment against hydrophobia for those who might come to seek it.

In this matter of pamphleteering it must be remembered that most medical men in practice are not in touch, and a large proportion from their training up have never had anything to do, with recent methods of bacteriological work and treatment ; therefore it is essential, in sending out the vaccines, to explain to them their use. Pamphlets enhance the value of such remedies a hundredfold : without pamphlets the vaccines are of no more use than the clinical thermometer, prescribed by the Central Midwives' Board in England, to the village midwife who is unable to read or write. Scientific workers are apt to complain that the public do not appreciate the value of their work, but the fault in my opinion is their own ; none but they are competent to translate their results into terms within the understanding of the common people, or even of those of good general education. They should look upon it as one of their most important duties to spread the results of their work, briefly and in an attractive form, through periodical literature, through

pamphlets, public notices and handbills, by public lectures with lantern slides, and in any other way that may suggest itself. This duty is fully recognised and carried out by the director of the Pasteur Institute at Kasauli.

The work at Kasauli has now been divided, that dealing with hydrophobia being awarded the whole of the Pasteur Institute, above described, with the late Major Lamb as its head, while Sir David Semple has been put in charge of all other work in a separate and magnificent building, constituting the Central Research Laboratory of India.

It is almost incredible that such work as I have attempted to describe should have been done in three years from the foundation of the Institute by Colonel Semple, with only two European assistants and one native, and with occasional help from other medical officers, sent to Kasauli for brief periods of study or spending their ordinary leave in the work. Good wine needs no bush.

## CHAPTER IV

### THE FLEA

THE first general research laboratory of the Indian government is established in the interesting old Government House at Parel, four miles north of Bombay, on the Bombay-Baroda line. This house was originally a Portuguese place of worship and monastery, confiscated by the English government on account of traitorous conduct by the Jesuits in 1720. Governor Hornby first took up his residence there in 1771. A post on the staircase and a portrait in the ballroom show the Duke of Wellington's connection with the place, and King Edward stayed there in 1875. Since 1880 the governors of Bombay have lived nearer to their work and to the sea-breezes at Malabar Point, and the old Government House was, at the time of my visit in 1903, given over to Mr. Haffkine. Haffkine's position was essentially peculiar ; like Topsy, it "grewed." The preparation of plague serum and devotion to bacteriological research on behalf of the Indian government should obviously be the work, the privilege, and the prize of the Indian Medical Service ; but he was not even responsible to the director-general of that service ; he was an independent appanage of the government of India.

Haffkine, a distinguished research worker under Pasteur at the Pasteur Institute in Paris, working at a prophylactic against cholera, succeeded in preparing a vaccine which would protect animals against lethal doses of the cholera bacillus. With introductions from Lord Dufferin, then ambassador at Paris, and others to the British government recommending that the prophylactic should be tried in India, facilities were accorded to Haffkine to prosecute his studies on the subject in India. He proceeded to India at his own expense early in 1892, and by 1896 succeeded in convincing the Indian government that the prophylactic was valuable.

Up to 1895, 70,000 injections of living cholera bacilli had been made in 43,000 individuals, and in no instance did any bad result ensue, while it would seem that the individuals thus injected were thereby strengthened to resist infection. But the effects were not entirely satisfactory, and it seemed likely that an injection of more virulent cholera bacilli (comma bacilli, as they are called, owing to their shape) would give a more perfect result. Inoculation of this virulent poison in guinea-pigs, however, produced sloughing of the tissues at the site of inoculation. Scientific heroism does not wince at self-vivisection, and Haffkine made the bold experiment of inoculating himself with virulent comma bacilli. Their effect, he fortunately found, was harmless to man, when carefully inoculated, and as a result the world is in possession of a most valuable preventive against a disease which kills millions in its oft-recurring epidemics. One instance may be given. Twelve

thousand coolies in the tea-gardens of Assam were threatened with cholera ; roughly speaking, half of these were inoculated and half not. Amongst those not inoculated 200 cases of cholera occurred, with 124 deaths ; amongst those inoculated there were only 27 cases and 14 deaths. Taking it for granted that the inoculated and the uninoculated were, in general, equally liable to infection, this instance shows a saving of 147 cases and 95 deaths.

These and other researches, apart from those carried out by Dr. W. J. Simpson, Health Officer for Calcutta, were at Haffkine's own expense. In 1896 the government of India asked Haffkine to proceed to Bombay and study the plague. It was there he set about preparing a prophylactic for the plague.

In 1897 Haffkine had already discovered and published a method of fighting the new scourge—new at least in its extent and importance—again testing it first upon himself. His method consisted essentially in growing plague bacilli in solution of the Japanese seaweed, agar-agar, in common laboratory use, in which they not only lived and multiplied visibly to an astonishing extent, but also produced those poisons or toxins which are the actual agents of the disease. This culture—bacillus and all—was then heated, and the bacillus thereby killed. Injection of the fluid was thus able to produce symptoms owing to its contained poisons ; but it would not produce the real disease, because the bacilli were dead—the manufacturers of poison were killed. Inoculations then of Haffkine's prophylactic, in large doses, might produce some of the symptoms of

the disease ; in small doses it only stimulated the tissues of the body to produce an antidote and be prepared to fight the real, living bacillus, if it happened to come along that way.

The Indian government recognised in Haffkine a great possession, and it was greatly to their credit that, laying aside all routine regulations, they retained him in their service. A Polish Jew by origin, a mystic and a man of reserve, who talks with care and always to the point, his appearance is large and striking, his general personality fascinating, Napoleonic both in his presence and in his genius. The magnitude of his work, the preparation of several million doses of this prophylactic, required a genius for management, and its supervision, one might think, would have given him ample employment ; yet at the same time he was able to carry on research work in several other departments, just as Colonel Semple at Kasauli was carrying on a vast amount of work in addition to his special work concerned with hydrophobia.

The series of rooms in which Haffkine's prophylactic was being prepared constituted a factory of considerable size. Shelf upon shelf was filled with delicate glass bottles, half full of broth, dimly illuminated by a stray gas jet. I saw the broth being inoculated with plague culture, and the culture at various stages growing down like stalactites from a scum on the surface into the depths of the broth. I saw the bottles heated and sterilised, thus killing the bacteria ; their contents being sucked off in glass pipettes, that make you long to blow soap-bubbles, and so dis-

charged into little queer-shaped bottles, which, in turn, were rubber-corked, labelled and packed. To those who are used to the careful methods, in general use, for sealing such products of the laboratory by paraffin or sealing-wax, the method employed at Parel seemed open to criticism, more especially when carried out, as it was, by soldiers and natives of indifferent education. It is true that many precautions, such as frequent passing of the necks of the bottles and other apparatus through the flame, and proper sterilisation of the bottles, were laid down in the rules of procedure ; but there was a certain *prima-facie* case to give grounds to those who, with considerable acquaintance of the Parel laboratory and its methods, maintained that the death of eighteen natives at Mulkowal from tetanus, after inoculation against the plague, was due to some flaw in the bottling at Parel. An account has already been given of this most unfortunate incident, which set back inoculation through the whole of India. The evil of it lay, not in the bereavement of eighteen families, who were consoled by seven hundred rupees each from the government, nor in the more general effect on the credit of the operation and on the credit of the government, but in the loss by government itself of confidence in the security of Haffkine's wonderful invention, thereby undermining the position which was gradually being acquired in official circles by medical research. It is melancholy that the public should appreciate so little the saving of thousands of lives by Haffkine's prophylactic as to have allowed so comparatively minute an accident to interfere in

any way with the life-saving work of Mr. Haffkine's campaign. Would a general in the field be so affected by the loss of eighteen men ?

Many fascinating observations were shown me at Parel by Captain Liston of the Indian Medical Service ; and one, which will be recorded in history, was the evidence he had accumulated in support of his view, little favoured at that time, that plague was conveyed to man by the rat-flea. This suggestion was first brought forward by M. Simond of the Pasteur Institute in Paris in 1898. The rat-flea, as he showed, is quite different from the flea that infests man, and it only attacks man when it cannot find a rat on which to live and is therefore hungry.

It is a common although not universal experience that plague in any locality is heralded by the death and emigration of the rats. When the surviving rats have left the place, plague attacks the inhabitants. It is easily demonstrated that, whereas the living rat harbours a multitude of fleas, the dead rat, so soon as the body has turned cold, is found absolutely devoid of its parasites. We talk of the rats deserting a sinking ship ; we may with equal truth talk of fleas deserting a dying rat. The process is instinctive. The flea draws its food from the rat's blood ; so soon as the rat dies, the blood ceases to circulate and soon clots. Forewarned is forearmed, and at death the fleas troop off to seek pastures new.

If, while their late host has been sick and dying, the other rats have fled, the fleas are left without further resource ; they must perforce accept what food they can, and they therefore fasten at once on Man. The

hero of science had here again submitted his body to the proof and triumphantly shown without doubt that he could attract the attentions of the derelict rat-flea. Now the rats thus found dead are found also to contain in their blood a large number of unmistakable plague bacilli; and as Major Ross proved the presence of the malarial parasite in the stomach and salivary glands of the mosquito fed on a malarial patient, so Liston wished to show the presence of plague bacilli digested and absorbed into the stomach walls and salivary glands of the flea. He found them in the stomach walls; but this only shows that when a flea lives upon blood its stomach will contain and absorb any bacteria that blood may contain. Ross' experiments with the mosquito only began here; his triumph ended when he was able to show the malarial parasite passing into the salivary glands and down the proboscis of the mosquito, waiting ready without a doubt to infect the subject of the next bite. So Captain Liston, to prove his point, had yet to prove the path of the bacillus from the stomach of the flea to the bite in the skin of the flea's victim. In fact it now seems probable that the bacillus does not infect the flea's saliva, but passes down the flea's gut, and is evacuated with other food-débris when the flea is feeding, being then rubbed in by various means to the opening made by the bite. To Captain Liston is due the credit of proving the cardinal fact.

This theory of rat-flea transmission as the usual means of infection in bubonic plague explains and draws support from several commonly observed facts. Thus, in the Punjab, at least, the plague is commoner





Women Washing in the Slums of Bombay.

amongst Indian women, who stay in the undoubtedly flea-frequented houses and compounds of the village, than in the men, who are out at their work all day. It is by common opinion a soil disease, absent where the floor of the dwelling and its surroundings are clean, present most of all in the filthy hovels of mud houses and the dark *chawls*, littered with rags and refuse, in the slums of Bombay (Plate 10).

The most striking piece of evidence that met me in this direction was the story of a gang of natives employed in disinfection in the Punjab. Plague was rife amongst them; it was taken as a matter of course, considering the nature of their work, and they were paid on a correspondingly high scale; but a medical officer, recognising the danger of infection through the feet and legs, obtained for them a Government issue of leather boots and leggings. During the ensuing season only one case of plague occurred amongst them, and on inquiry it was found that the patient had expressed a great dislike to the use of boots and leggings, and had taken them off whenever he thought he could escape observation.

But doctors differ—until a truth is fully proved. In the face of all this evidence, and the general opinion of nine-tenths of those who had seen anything of plague work, may be set the opinion of the late Dr. Hunter, government bacteriologist at Hong-Kong, which has also suffered heavily from plague since 1894. This young authority, already eminent at the time of his recently lamented death, pointed out the fact that the bubo frequently made its appearance several days after the onset of the illness, and that it

was not only one particular gland, but the whole glandular system, that was more or less affected. He concluded that plague was primarily a general disease of the body at large, infected through the food or air tracts, and that the affection of glands, internal or external, with the eruption of buboes, was merely a local manifestation of the disease, similar to the skin eruption in smallpox and measles. This was a return to the view of older writers, and would have left us no nearer to the means of infection or to a policy of prevention. But it was contrary to common experience and is now finally abandoned.

The more usual form of infection in India is shown by the buboes, the enlargement of glands in the groin, the armpit, or the neck, whose normal function is to filter the juice from every tissue in the body, on its way to dilute the blood close to the heart. The enlargement shows the endeavour of these glands to arrest the flow of plague infection from a fleabite on the ankle, or a crack under the finger-nail, or a scratch on the face, into the general circulation. The bubo may suppurate, may form an abscess, and this is not necessarily opened by the knife. The natives apply leeches or green herbs, and wait for it to burst. But, whether it suppurate or not, there is no danger to the life of the individual until this natural filter has leaked and let through the plague poison to the general circulation. Then it produces fever, prostration, heart failure, and commonly death.

The common form, then, of Indian plague is spread by the bite of the rat-flea. But elsewhere, and even to some extent in India, outbreaks and cases not

uncommonly occur of the pneumonic form of plague, in which the infection is perhaps derived from dust, and leads to pneumonia, usually with fatal result. Such was the case in the outbreak which originated a few years ago in a laboratory in Vienna ; such too the few cases that justly caused alarm last winter in Essex ; such the outbreak in Manchuria resulting in 60,000 deaths. Even in April, 1911, the international conference at Mukden, under Wu-Tien-Leh, whom as Dr. Tuck I met at work in the Malay States (see p. 107), has been unable to decide what part, if any, has been played by the tarbagan, the common Manchurian rodent. The channel of infection in pneumonic plague—the form we in England have most to fear—is still in doubt, and until that is settled, systematic and certain prevention is impossible.

A single striking discovery of world-wide importance, like that of Ross concerning malaria, suggests to observers throughout the world its applicability to other diseases. The pioneers of medicine, more especially those inspired by tropical work, are trying their utmost to prove or disprove the part played by insects—the “intermediate hosts,” as they are called—in the transmission of every infectious disease known. The essential part played by such intermediate hosts has been proved in the case of yellow fever, transmitted by a different variety of mosquito ; in that of sleeping sickness, transmitted by one form of the tsetse fly ; in those of rinderpest, surra, Texas fever, and several other devastating diseases of horses and cattle ; and now in that of bubonic plague. The analogy in the case of other

diseases is too tempting to be lightly dismissed. Dr. Hunter's work at Hong-Kong was a fine example of the official encouragement of research. In most cases in Hong-Kong in which the cause of death was not certified by a medical practitioner on the colonial medical register, the body was taken by the police to the government mortuary; and as there were but few Chinese names on the medical register, and a large proportion of the population was Chinese, 2326 bodies were thus examined during the year prior to my visit out of 4905 deaths, requiring an examination therefore of as many as 30 bodies a day. This is probably an unrivalled opportunity for good post-mortem work, not least with a view to the study of plague. In addition to these examinations, others included in the above total of deaths were examined at the mortuary across the harbour in Kowloon; 101,056 rats were examined bacteriologically; a cattle disease was investigated and found not to be true rinderpest; and 7074 tubes of smallpox vaccine were prepared during the year. The government had built Dr. Hunter a good bacteriological laboratory, and have since then built a good mortuary at Kowloon. The former, recently enlarged, was large enough even for these wider purposes, and well arranged; and there was a good staff of assistants, some of whom were qualified to do the bacterial work themselves under the general control of the bacteriologist.

The value of research work is tested, not by the accuracy of the theories appended to it, but by the general quality and direction which it displays. A

good director is constantly asking himself questions and shaping the work of his laboratory to give him the answers. The answers given are at first mere rumours, which must be tested again and again, until the verdict is given, full and unmistakable ; like the chorales of an oratorio, summing up the previous numbers, given out on the full organ, and joined in by the whole congregation.

So the rat-flea theory of the transmission of plague has in six years gained acceptance throughout the world, established not least by the well-grounded but intermediate opposing theories of the government laboratory at Hong-Kong. After some years of unjust suspicion and short-sighted treatment M. Haffkine has returned to service under the Indian government, working in the original research laboratory of the English hospital at Calcutta. India is likely to reap a rich harvest from his genius and his thoughtful, persevering humanity ; while the Indian government deserve the utmost credit for retracing a wrong step, taken under sore trial, and for securing again their chief scientific asset. The government of Hong-Kong no less may still boast of their provision for research, may well honour the memory of Dr. Hunter's sterling work, and may justly be held up for an example in the encouragement of research that should have been followed many years ago by every government, autonomous or maternal, throughout our empire.

Had such provision been made on a business footing twenty years ago, millions of deaths and treasure beyond value would have been saved through speedy determination even of the Indian plague alone.

## CHAPTER V

### BERI-BERI

A RESEARCH INSTITUTE, surpassed in importance by none throughout the empire, is that at Kuála Lumpúr, the capital of the Federated Malay States. It was founded in 1900 by the government of those states with a view to the investigation of beri-beri, a disease which has caused a very great loss amongst Chinese and Indians, especially in the Straits Settlements, in China and in Japan. This disease, first mentioned in a Chinese work in 200 B.C., and in a Japanese medical treatise in the ninth century, was brought by the Dutch to European notice in the early years of their East Indian history, and studied later in India and more recently in Brazil and Japan. It is now one of our imperial problems. Singapore and Kuála Lumpúr are good fields for the purpose of studying this disease. In the Pauper Hospital at Singapore in 1904 were no fewer than 260 cases amongst the 600 inmates ; and for some years past between 1000 and 2000 cases had been admitted to hospital every year in Singapore. What is this imperial problem ? And, first, what is the nature of the scourge ?

Beri-beri or, in Japanese, *kakké*, consists of a paralysis of the limbs, more especially of the legs, due

to an inflammation of the nerves (peripheral neuritis), complicated by dilatation and weakness of the heart, and in many cases by dropsy. According as there is or is not dropsy, the case is called one of "wet" or "dry" beri-beri. This affection of the limbs is very similar to that which occurs as a late symptom of severe diphtheria, or an occasional sign of continued alcoholic poisoning; indeed, it was always considered a direct result of alcoholic poisoning until an outbreak in Manchester was investigated in 1900.

It will be remembered that some stir was caused by the discovery that the Manchester cases were due to poisoning by arsenic contained in beer that had been drunk by the sufferers; and the preparation and examination of the malt employed in brewing processes had to be fundamentally revised. But beri-beri is certainly not due to the drinking of beer, arsenically tainted or otherwise, for, as a rule, the Chinese and Malays are not beer-drinkers. A merchant captain in Singapore told me that he and his chief officer, both of them teetotalers, once had the disease in a mild degree when they were carrying an infected crew. Beri-beri is due to a different poison.

It is the scourge of many of the mines and plantations of the Malay Archipelago. An island taken over by a telegraph company, for the establishment on it of a telegraph station, was previously but little inhabited, and certainly not suspected of harbouring any pestilence. Some 700 coolies were imported for the labour that was required, but within a few months half their number were down with beri-beri, and the work had to be stopped and the island for a

time abandoned. The disease is apt to break out among coolie gangs engaged on plantations in the East Indian islands or on extensive engineering works in the tropics, such as the railway in the Belgian Congo ; it haunts the Dutch army in Sumatra ; in former days, until better conditions of health were obtained, it was common enough amongst British troops in India ; it frequents Brazil in the Far West and Japan in the Far East ; out of the first 1000 Chinese coolies imported to South Africa in 1904 there were over 60 who developed the disease during the voyage from China ; and in Calcutta it seldom occurs except amongst the Chinese.

*Kakke* was rife in the early days of the modern Japanese navy. It was stamped out by Dr. (now Baron) Takaki, who at the age of twenty-eight, having obtained his medical education at St Thomas's Hospital and his Fellowship of the Royal College of Surgeons, was made Director-General of the medical service of the Japanese navy. He resolutely set to work to inquire into the cause of the disease. The rice diet was impugned ; the diet accordingly was changed, and beri-beri became almost as extinct in the Japanese as it is in the British navy. The cause then, said Dr. Takaki, lay in the rice. But this conclusion was stoutly disputed. While Dr. Takaki was inquiring into the causes of beri-beri, did he stand still as regards the other conditions affecting the health of the Japanese sailor ? Certainly not. He set himself assiduously to improve the conditions affecting their health in all respects, and it might be any one of those improvements, concurrent with the

change of diet, that effected the stamping out of the disease. Let anti-vaccinationists listen.

The death-rate from beri-beri on Christmas Island, where the science of tropical diseases in 1902 suffered an irreparable loss in the death of young Patrick Manson, had in 1904 gone down from 90 to 45 per 1000 in two years, and in Singapore the sea-side treatment, in simple *attok* or grass huts, had been most successful.

An experiment, considered crucial at the time, was made twenty years ago in the lunatic asylum at Singapore to test the share of rice in the causation of the disease. Twenty healthy lunatics on admission were separated from the rest in two cottage blocks. For some years there had been a good deal of beri-beri, which the authorities were unable by any means to stamp out. These twenty healthy patients were fed on European food without rice, but in six months half of them showed symptoms in greater or less degree of beri-beri. Surely then rice was not an essential factor in the disease; the soil and buildings were infected. It was necessary therefore to remove the patients to fresh soil and surroundings. To attain this object the patients were sent to wards by the seaside at Pasir Panjang. They bathed once or twice daily in the sea, and then were massaged; their clothing was changed, disinfected and washed twice a week; beds, bedding, walls and floors were washed and disinfected with perchloride of mercury weekly; the sand of their compound was scraped up weekly to a depth of two inches, and exposed in baskets to one tide of the sea

and to the sun before being replaced ; and their plates and utensils were disinfected with perchloride twice a week ; but the diet was the same as at the lunatic asylum, with rice, and with only tea to drink. The result of this move is shown by these figures :

Year	Average No. Resident	Beri-beri New Cases	Deaths
1900	180	153	51
1901	164	102	15
1902	174	99	4

The four deaths in 1902 were those of patients who, on account of overcrowding, had to be kept under the old conditions in the former asylum ; the new conditions had absolutely stamped out the fatal form of the disease, despite the continued use of rice. The experiment was suggestive, but on too small a scale to eliminate possible errors. The patients officially deprived of rice might possibly have obtained it nevertheless, or might have had the disease on them from the first. The effect of sea-bathing and massage only proved the power of a healthy body to overcome disease. And so between 1904 and 1906 the patients were kept on cured or uncured rice alternately ; the disease disappeared entirely when the rice was cured, reappeared when it was uncured ; in 1906, on cured rice only, there was not a single case of the disease.

The late director of the government research institute at Kuála Lumpúr, Dr. Hamilton Wright, of McGill University, Toronto, had recently issued a full report as the result of his investigations on the subject. Both Wright and his successor, Dr. Daniels, believed that the disease was due to a parasite, just

as diphtheria is due to a definite bacillus, and that the paralysis both of beri-beri and of diphtheria were due to the poisons formed by the respective bacilli. Wright however went further, and believed he had found the breeding-place, the primary seat of this disease within the body, corresponding to throat and tonsils in diphtheria. Unfortunately beri-beri is a very chronic disease, and, by the time that cases could be examined post-mortem, Wright maintained that the primary stage of the disease had passed away. This primary stage he believed to be an inflammation of the intestine at its opening from the stomach—the duodenum—suggested by a pain in the pit of the stomach of which patients in an early stage often complain. He found a little evidence of some such inflammation in his examinations after death. Hunter at Hong-Kong bore out these observations, but they are not accepted by general opinion in tropical medicine.

On the other hand Drs. Fraser and Stanton, working more recently at Kuála Lumpúr, have lately summed up the evidence in favour of Braddon's original view in the medical archives of the Federated Malay States for 1901, that, for some reason or other, the disease is commonly caused by white rice. The medical officer of health at Bangkok has lately declared that the disease can be prevented and in most cases actually cured by the substitution of par-boiled for white rice.

It appears that the white, polished rice has in the process of polishing lost some substance essential for the nutrition of the nerves and associated with

phosphorus in a constant proportion. That substance may be merely a simple compound of phosphorus; but the practical point is that a diet of polished rice is insufficient to prevent the disease; add the polishings, or give only the whole rice, and the disease may be both prevented and cured. The enthusiasts for standard bread may draw a moral from the analogy.

Beri-beri, then, is a disorder of nutrition; it is probably not bacterial in origin; it is probably not infectious.

One's first experience of beri-beri in comfortable beds and spotless linen in the fine wards of that worthy imperial institution—the London School of Tropical Medicine at the Albert Docks—gave little idea of the true extent of the disease in all its gravity.

Such an idea was given in an afternoon's visit to the Singapore hospital, especially by a parade of the convalescent cases for my inspection—a melancholy march of cripples, dragging their legs behind them and shuffling along with the help of sticks and crutches. It is there on the spot, with abundant material for investigation, that ample investigation should be conducted; and yet there in Singapore not a single man has leisure or opportunity, in the multitude of his existing duties, for the purpose.

It is idle to retort that at Kuála Lumpúr, in a better climate, there is such an institute established specially for the purpose. If we only realised the true importance of setting ourselves with determination to discover the remedy for this scourge we would double the staff at Kuála Lumpúr, and we would also

establish a good research laboratory, properly equipped and staffed, at the expense of the imperial government, at Singapore. The disease is imperial in distribution and importance, demanding closer attention than has yet been given it by the authorities, and isolated colonies cannot be expected to pay for imperial research.

The staff at Kuála Lumpúr consisted of the director, his assistant, Dr. Lester, and a young Chinaman, Dr. Tuck, a truly scientific and zealous worker, with a travelling fellowship from Emmanuel, Cambridge, whither he had been sent by the government of Hong-Kong with a Victoria Scholarship of £250 a year for five years. It is this Chinese sage—Dr. Tuck, *alias* Wu-Tien-Leh—who in April, 1911, has been presiding over the international plague conference in Mukden, and whose presidential address, published in *The Lancet* of 1st May, shows his width of view.

The laboratory, on a good site, a mile outside the town, was well fitted up, the apparatus including various costly novelties devised by the first director, an ingenious Canadian—such, for instance, as the stereoscopic, binocular, beetle-trap microscope, which, like most ingenious novelties, was not in use. The purpose of the institute was in the first place to investigate beri-beri; but its aims were soon enlarged, and in 1904 Dr. Daniels was providing facilities for investigation into all phenomena of disease by officials of any government department concerned with live stock, whether animal or vegetable. In the insectorium, kept at a fearful heat and

saturated with moisture for the purpose, the director showed me, for instance, a sugar-cane invaded not by a beetle but by a boring butterfly larva, which made way for the entrance of destructive red ants, and these in nature would promptly make an end of that shoot of sugar-cane. He showed me the sheds and enclosures for cattle under investigation in connection with rinderpest, and experimental plantations of rubbers, sugar, coffee, grains and fruit-trees, for research into diseases of plants by the forest department.

The direct commercial value of such an institute at the present time can hardly be exaggerated. It is extraordinary how new ideas come to the worker in human disease from the consideration and observation of disease in animals and plants. For practical purposes it may not be well to add this or any other subject to the medical curriculum at home, but in academic centres and for purposes of academic research it is worthy of serious consideration whether a brief account of comparative animal and vegetable pathology, and some practical experience of a herbarium and a veterinary hospital, might not with advantage be included in the course of those seeking the higher medical degrees. The theory of medicine ought not to be confined to a study of disease in man ; and such an extension of the field of view would be likely to throw considerable light on the nature of many diseases which it is absurd to suppose can be unravelled from a consideration of their effects in one single species of the animal kingdom alone.

## CHAPTER VI

### “SEEK AND YE SHALL FIND”

IT is easy enough to state the magnitude of imperial problems, to set the world aghast at the dangers they suggest and to call aloud for help. But to give help requires knowledge of the cause and site of the trouble, followed by the invention of a remedy.

It must be agreed that investigation of any disease should go on in as many quarters of the world as possible in order to understand its behaviour under varying conditions of climate, race and habit ; that the work should run on comparable lines, should be continuous, and, above all, effective. Under proper organisation, the imperial authority would subsidise research work in every dominion and colony, requiring certain conditions in return for the grant made and linking up the whole into one system with interchangeable personnel and a graded remuneration, sufficient to attract and retain men and women of ability. Many women are well suited for research.

In the hope that some such proposal may before long be considered by the imperial authorities it may be as well to give some account, in addition to that already given, of the spade-work being carried on in isolation in laboratories farther east. Much ground, fresh and old, is being constantly turned over, and

every now and again some glint of precious knowledge is descried, to be passed through the clearing-house of science, credited to the account and cashed when sufficient to meet the creditors who press on every side. Systematic research will increase the effective output of our laboratories a hundredfold.

Some account has already been given of the research establishments at Parel and Kasauli in India and at Kuála Lumpúr in the Federated Malay States.

The next research institute visited was that established in the French colony of Cochin-China. The great *Hôpital Militaire* of Saigon is a general hospital of five hundred beds or so, including an infectious block, and is managed by the military doctors. In its compound stands a separate block, the Pasteur Institute of the far east, founded as a direct descendant of the parent institute in Paris. M. Métin, the distinguished director, was at home on furlough. Himself a *médecin major de la première classe*, his *adjoint* Dr. Brau ranked as a captain, and the staff was completed by M. Bréaudat, *pharmacieur major, deuxième classe, troupes coloniales*. Their actual equipment for research, as regards special incubators, autoclaves and appliances, was superior to that at Kasauli, but their rooms were not comparable. They had nothing like Colonel Semple's new laboratory or stable ; they had only one rather small block, and there was little ground at their disposal. But the charming part of scientific research is that its value depends almost entirely on the worker, and hardly at all on his apparatus ; by far the chief

requisite is scientific material, and of that they have plenty both at Kasauli and at Saigon.

This institute, founded in 1890 or earlier for the treatment of rabies, was reorganised in 1901, and its work in the following year included (a) the preparation of over 2,000,000 doses of vaccine; (b) the treatment of 67 cases of rabies; (c) the preparation or distribution from Paris of antitoxic sera for snake-bite, tetanus, diphtheria, blood-poisoning and plague; (d) disinfection of infected clothing; (e) biochemical analyses and researches of a stimulating order on such things as manures, indigo and the useless, imputrescible and almost incombustible paddy-husk; (f) scientific examinations into material from the hospital; and (g) researches on dysentery, on beri-beri (with the usual negative result) and other tropical diseases. The bacterial work included the investigation of Métin's cocco-bacillus of dysentery.

Vaccination has had such a striking effect, and has been so widely adopted in all Eastern countries ruled over by Europeans, that we are inclined to forget the extreme gravity of the scourge which it has to a large extent stamped out. Indeed it is not only in European-governed countries that vaccination has been adopted. The Coreans for instance decided some ten years ago to institute a service of vaccination, but they did it in their usual lackadaisical way. They instituted half-a-dozen vaccination stations throughout the country, fairly well equipped, at least with vaccinators; but my own informant, a Japanese naval doctor at the head of the Japanese civilian hospital at Seoul, assured me that not a single

inoculation was ever done; the money simply evaporated.

In French Indo-China, however, the process has been properly systematised, and in 1903, 318 buffalo calves were hired during the year to produce the 2,000,000 doses, more than a quarter of which were exported, chiefly to Singapore and Hong-Kong. The system of hiring the buffalo calves is to be commended on the score of expense. They are hired when two years and a half old, for two Mexican dollars (4s.) a week, plus transport. Brought into the institute on a Tuesday, they are inoculated by the lymph which has given the best human results on Wednesday, and the pustules squeezed dry with *la pince chambon* (pincers perpetuating the honour of their inventor) on the following Monday. The calf is then returned to its owner. The pulp from the pustules is mixed with lymph and glycerine in proportions of five, one and three, and gives remarkably good and constant results, 94 per cent. of the primary vaccinations being successful, while, when performed at the laboratory itself, over 99 per cent. are successful. To show the value of precautions such as are taken by the laboratory staff in securing proper results, it may be mentioned that revaccinations in general proved effective in only 5 per cent. of the cases, but, when performed in the laboratory, in 37·5 per cent.—revaccination in the laboratory was seven times as successful. Vaccination is performed by the various *médecins des postes*; and for purposes of organisation Cochin-China is divided into eastern and western divisions, each being toured over by a

single vaccination officer, under the *Chef du Service de Santé*. The Pasteur Institute would like to carry out the vaccination themselves, with two extra men to help them, and believe it would then be far more effective ; for it should always be a principle, hitherto very seldom recognised, that research work and administration should go hand in hand. It is absurd in any branch of life to divorce theory from practice, and we at home are blatant sinners in this respect.

For the treatment of rabies 135 patients presented themselves, but only 67 were treated, the remainder being acquitted from danger by the incriminated dog not dying within six days. It is found that rabies can only be given by a dog within three days of its death from the disease. This fact of its death is the only diagnostic method of any use ; for if the dog be killed and its head sent up for examination, characteristic lesions are seldom found under the microscope ; and inoculation on the other hand takes too long, as it is a fortnight before a guinea-pig shows signs of the disease. At Kasauli they commence treatment without waiting for the verdict of the inoculation experiment ; at Saigon no treatment is given for three days, and thereafter only if the suspected dog has died during this interval. This delay certainly saves half the patients from unnecessary treatment, but time is of vast importance in virulent cases, and it may be due to this delay that two cases were lost at Saigon in 1903, as symptoms began respectively on the eighteenth and twelfth days of treatment. It would seem best to combine the two systems in vogue at Kasauli and Saigon ; to com-

mence treatment in all cases at once ; to keep the dog alive under observation at all costs, in order to see if he dies within the three days ; and in all cases to perform the control inoculation experiment upon a guinea-pig. Of course at Kasauli, a distant hill station reached only in most cases by a long train journey, it would be impossible in most cases for the dogs to be sent with the patients ; but they might quite well be kept at police-stations under the supervision of the local civil-surgeon, who could easily certify as to their death, and wire it to Kasauli. It is certainly a remarkable result in twelve years to have treated 689 certain cases at Saigon, with only 13 deaths.

As further evidence of the value of the Saigon institute, and of the cosmopolitan outlook of hospital work, it was interesting in Tokyo to meet with a young Scotsman, who had been bitten by a mad dog up in the Shan States, and had journeyed down with all possible speed to Saigon, where he had been successfully treated. It is difficult for those who have never been in uncivilised countries to realise the solid comfort represented by an assurance that such treatment is available. Such evidence goes far to modify the terrors of the exile and the dangers of pioneer work on the outskirts of our empire.

As to the disinfection of infected clothes, which is performed by the Pasteur Institute for the whole town, it is curious to find the discredited sulphur still in use in cases where steam under pressure is unsuitable. Sulphur, it has been found, and is not, I think, disputed, is only effective in killing insects and

larger animals, and never in killing the germs of disease. Fumigation by sulphur lives on in England only because of its unpleasant smell, which makes the laity realise that something is certainly being done.

In his researches into the causation of tropical disease, M. Brau had reached an interesting stage with regard to cholera. By growing the cholera bacillus on a blood medium in a bottle, and inoculating dogs with the culture, he was able from the dogs' blood to recover the cholera poison increased in virulence. He thus claimed to have obtained a cholera toxin of fixed strength, and hoped in the next stage, by injecting this fixed toxin into a dog in increasing strengths, to immunise him against the disease, and so prepare from his blood an antitoxin. Since then he has by a modified method succeeded in preparing a trustworthy antitoxin for the cure of cholera, in addition to the prophylactic first made by Haffkine for prevention of the disease.

One of the most famous of modern bacteriologists lives also in Indo-China, about a day's journey up the coast, but works independently of the Pasteur Institute, in a private laboratory of his own. M. Yersin is chiefly known for the fact that he and Kitasato, the Japanese authority, were both invited by the government of Hong-Kong to come over and help them at the outset of the present epidemic of plague in 1894. The plague bacillus was first discovered by both men independently within a few days of each other. The credit of the description belongs primarily to Yersin. Yersin now prepares

an antitoxic serum for the actual treatment of cases of plague. This in theory would be a great improvement on Haffkine's vaccine, for the vaccination can only gradually stimulate the body to produce an antidote, ready to meet any subsequent attack; the antitoxin already prepared is itself the antidote, and may be administered as a medicine at any stage of the disease. Moreover, the Asiatic native does not care to submit to precautionary measures. Unfortunately for research, there had been no plague in French Indo-China on which to try Yersin's new serum. Yersin's former serum, which he tried in India, was, comparatively speaking, a failure; but it appears that in India Yersin experienced much difficulty from his non-observance of the proper customs and formalities. His serum is now said to be useful at least for Europeans, who show a lower fatality, except in pneumonic plague, and are said to have a greater power of resistance than Asiatics—although this difference again may be merely due to better notification of mild cases in Europeans.

Leprosy plays a considerable part in the life of the French colony, and in the researches therefore of the Pasteur Institute at Saigon. The sages were trying to prove that the bacillus had its primary seat in the nerves; such a fact, if proved, would obviously be the starting-point of observations and methods which might lead to a real cure of this at present most extensive and incurable disease. A charming young savant had been working voluntarily, both up-country and at Saigon, on the kindred disease named yaws, a very chronic but infectious eruption on the

skin, which occurs extensively throughout the greater part of the tropical world. This genial, soft-bearded devotee of science was out there at his own expense. He had recently translated Manson's "Tropical Diseases" into French, and was just going to England to take out a course at the London school.

The work of the institute is reported in full in the official *Annales* published by the French Colonial Office, a modest but most interesting little periodical. It is to be wished that our Colonial Office might condescend in this respect to follow the lead of Germany and France, and publish a similar official digest of the vastly important material in matters of tropical medicine and sanitation that are constantly coming to their hand. As it is, I believe the reports go down to the library of the School of Tropical Medicine at the docks, and are decently interred in glass book-cases, without even so much as a catalogue to record their last resting-place. Here is a vast field of material wasted.

*The Journal of Tropical Medicine*, published every month, gives an abstract, one by one, of the colonial reports; but these reports, to be made valuable and available to every sanitary administration in the empire, require careful collation and comparison in the light of experience, as can only be done in a government office, year by year. The annual report of the medical officer to our Board of Education forms an admirable and most useful precedent.

Without complaining, for the empire is young and the imperial sense is still younger, it is well to call attention to the latent privileges and opportunities

afforded us by our empire ; our first duty and interest should be to catalogue them ; and so to classify, digest and publish to the world in a palatable form the extensive information we have of imperial dangers, the methods with which to meet them, and the work done to devise new safeguards, new methods of action, in a department of imperial life so important as that of health.

The main impression of the visit to the Pasteur Institute at Saigon was, as my French friends said, that "there is no nationality in science," that the true research worker has a fine game to play, and that he plays it well. The same was the experience of visits to similar institutions at Shanghai and Tokyo.

The municipal laboratory at Shanghai is a smaller affair, under the supervision of the British Health Officer, Dr. Stanley, my fellow-traveller to Aden in the previous year, trained and well known in the London schools. The laboratory is well built in red brick, and is the property of the municipality, which represents fifteen different nations in the foreign quarter of Shanghai. Matters of public health are evidently considered the domain of our race, and as an example of what may be done by energy, with little material and still less encouragement, this laboratory deserves a notice.

The preparation of vaccine is again one of their chief operations. I found the calves putting their noses round the corner in the yard, prior to being scraped, slaughtered, and examined post-mortem as a guarantee of their health. In a recent year, of

which Dr. Stanley has sent me his annual report, 60,000 doses of vaccine were issued; against the plague 615 doses of Haffkine's prophylactic were made; antitoxins against glanders, tuberculosis, diphtheria and cholera were being prepared; and 47 persons had been treated for rabies, without a failure—268 persons had been so treated up to the end of 1909. It was interesting to find that the rabbits inoculated with emulsion of an infected brain died here on the tenth to the fourteenth day; in Paris on the fourteenth to the twenty-first; and at Kasauli on the eighteenth to the twentieth. Rabies in mid-China is evidently of exceptional virulence. All the apparatus was very complete, modern and efficient; there was a good staff of assistants; and Drs. Stanley and Moore, besides doing necessary sanitation work, analysing in the year 31 samples of water and 383 of milk and examining 18,265 medical specimens, were able to spare a little time to research.

In Tokyo the Institute for Infectious Diseases is, somewhat unexpectedly, an example, in the first instance, not of government foresight but of private generosity and patriotism. In 1891 Professor Kitasato, on his return from Berlin, where he had served a memorable apprenticeship under Koch and, with Von Behring, had worked out the tetanus and diphtheria antitoxins, was considering a plan of devoting himself to the investigation of infectious disease. A Japanese gentleman named Fukuzawa at once volunteered to give him financial aid by erecting a new laboratory and paying for its main-

tenance. The Emperor, however, had already given Kitasato a scholarship, to encourage him to continue his investigations in Germany, and the Japan Private Hygiene Association decided therefore to establish an institution for the purpose in the country. Mr. Fukuzawa presented them with the free use of the building he had constructed, and the land on which it stood. The institute, under the auspices of the association, was opened on 30th November 1892, with Kitasato as its president. Funds for the work were subscribed by several persons, both foreign and Japanese, but, being inadequate, were supplemented three months later by a government grant of 20,000 yen (£2000) for building purposes, and 15,000 yen (£1500) per year for expenses for three years. The present building was therefore erected, and completed in 1894; the grant for maintenance was renewed in 1896; and in 1899 it was made a national establishment. The Budget for the year 1903 was 48,518 yen (about £4850).

The work of this institute is divided into three departments. In the first Professor Kitasato attends to all matters relating to research as to the causes of infectious and other diseases, and their prevention; in the second he superintends the hospital, and has the control of all routine bacteriological examination; in the third he investigates methods in use for prevention of disease, disinfection and treatment, and the arrangement of courses of instruction. Each department has its separate head, with so many assistants respectively attached to them. Many physicians from the schools of different prefectures,

and many medical officers in the army and navy, with a few foreign visitors, study bacteriology in the institute.

The institute is of course built on European lines. The library, for instance, into which the visitor is first shown, might be a well-equipped example of any such library in Germany, with an incongruous bronze bust of the president, in European style, on a marble column. This bust, much as it may shock artistic feeling, was presented to Professor Kitasato on his return with Professor Oyama from his noteworthy visit to Hong-Kong in 1894, under the commission of the Japanese government, to study the plague. On the ground floor is also the chemical laboratory ; on the first floor are two large and six small laboratories for research and for the general work of the institute ; while in an adjacent building is the students' training-hall, with a lecture-room for 150 persons, and a long laboratory. Other neighbouring buildings include two for a hospital, a photographic building, a dissecting building and a house for the animals kept for purposes of experiment. For the latter object, however, large animals, particularly for the purpose of experiments with antitoxin, are kept in a large stable, two miles away, with accommodation for twenty horses.

In consequence of the share taken by Kitasato in the discovery of the antitoxins for diphtheria and tetanus, these two subjects naturally take the first place in the report of the institute, and in ten years nearly 5000 cases of the first and 74 of the second disease were treated, with the low mortality respectively of 10 and 55 per cent.

Much work again is done, according to Pasteur's methods, for inoculation against hydrophobia. In six years 428 persons came for treatment ; only one of these, a Russian, was a failure. When cholera broke out in Japan in 1895, as a direct result of the war with China, Kitasato undertook the care of the city hospital, specially established for this disease, and first tried the inoculation of antitoxic serum. Of the patients thus treated, 33 per cent. died, while of those not so treated 70 per cent. died. In 1902 cholera again prevailed ; patients were treated with antitoxic serum, while a sufficient quantity of cholera vaccine was prepared for the use of 2,000,000 persons, and distributed for preventive purposes. The statistical result of this method of prevention is not forthcoming ; that of the treatment of patients by serum shows a death-rate of 51 per cent. As I have said, in speaking of similar work at Saigon, this treatment is at present in a very early stage, but offers abundant scope for development.

The chief triumph of this institute in original work is in connection with dysentery, prevalent in Japan and other countries of the temperate region to a serious extent. Whereas the dysentery of the tropics is caused by an *amœba*—a small parasite, looking under the microscope like a drop of jelly—and commonly gives rise to abscess of the liver, the dysentery of Japan, which is not associated with liver abscess, was discovered in 1897 by Dr. Shiga, formerly chief of a department in this institute, to be due to what is now called "Shiga's bacillus," resembling to some extent the bacillus of typhoid fever. The

further most important discovery was made that an antitoxic serum derived from this bacillus was an exceedingly effective remedy. The results of its use in the last few years have given a death-rate of from 9 to 12 per cent. as against 30 or 40 per cent. under ordinary treatment. The method is also used throughout Japan, far away from Tokyo, with most satisfactory results.

Furthermore, Shiga devised a method, similar to that used by Haffkine for the plague and similar to that used for cholera, as a preventive inoculation against dysentery. In August, 1900, dysentery broke out at Koai, a little village in the prefecture of Kanagawa, and twenty-eight persons were attacked within the month. Thereupon all persons in the village over four years of age were required to be inoculated—compulsory measures, be it noted. Except for two cases which occurred on the first day after inoculation, not another case followed.

Similar methods were in active use against typhoid fever, erysipelas, plague, and bites from the most poisonous “habu” snake. This poison is of such intensity that one gramme will kill 1000 rabbits, and one-tenth of a gramme will kill a horse. Three hundred human cases of bite from this snake occur on an average every year, and the mortality is generally one in seven. The use of the serum as a remedy, and the immunisation of cattle, horses and sheep, are both in their infancy, and offer a most hopeful prospect.

The use of the serum prepared against the plague in Tainan, the capital of Formosa, gave the en-

couraging result that equal numbers treated under precisely identical conditions, on the one hand with serum and on the other by general methods without serum, showed a respective mortality of 34 and 62 per cent. in favour of the serum. On the other hand, 200,000 persons had been treated in Formosa, and in Osaka, the Manchester of Japan, with a vaccine as a preventive, and very few of them contracted the disease.

The Serum Institute in which these sera are prepared is a different building to the original Institute for Infectious Diseases, and is located in Shiba Park, Tokyo. It was established in 1896 by the state, also with Kitasato as its zealous president, with various rooms and stables for the different departments of its work. Another stable is established in the southern part of the city, three miles from the Serum Institute, consisting of seven buildings for the constant accommodation of 150 animals. A special interest attaches to a separate building, a veterinary isolation hospital, intended for quarantine purposes in case of an infectious outbreak amongst the animals, with stabling for 50 horses. The bottling, labelling and other processes connected with the work are done by little Japanese women, in white antiseptic overalls, a strange illustration of modern developments in Japan.

Finally, mention must be made of the Lymph Institute, established by the state in 1896. A similar institute built at the same time had a brief career at Osaka. The first institution for the preparation of calf lymph in Japan was founded by the

government in 1874, but was closed in 1888, and the production of lymph was left to several irresponsible private institutions. The present building is the result of a representation made by the Central Hygienic Bureau to the Minister of Home Affairs, under whose supervision it remains. The expense of maintenance for 1903 was 46,000 yen (£4600), in return for which sufficient lymph was produced to vaccinate 4,000,000 persons. The Lymph Institute also is under the presidency of Kitasato. The price of one tube of lymph, sufficient for five vaccinations, is five sen, or one penny. To those who purchase it for charity half-price is charged, and this accounts for over half of the 600,000 or 700,000 tubes sold annually.

When we consider that in 1868 the Shogun was still in power, and Japan was little in advance of China in her knowledge of western civilisation, these results are perfectly astonishing. If so much can be done—mainly, be it noted, by direct government action—in thirty-five years, is it not melancholy and ludicrous, is it not a scandal, that such work in wealthy Britain should be allowed to languish and to eke out a precarious existence for lack of funds, whereby we are unable to prevent preventible deaths occurring daily and hourly throughout the length and breadth of the empire?

## CHAPTER VII

### MALAYA AND THE SCIENCE OF TOWNING

TWENTY-FOUR hours round, up the coast from Singapore, backwards along the route I had come from Calcutta, past Malacca, the oldest European establishment east of Suez, brought us up to Port Swettenham, where one lands for Kuála Lumpúr, the capital of the Federated Malay States. The Malay Peninsula is a long arm stretching downwards in line from the boundary between Burmah and Siam, consisting in its southernmost end of the Federated Malay States and the separate sultanate of Johore on the one hand ; and of " The Colony," or the Straits Settlements, on the other.

The colony consists of the island of Singapore and a few scattered but important settlements which, except for the little island of Labuan off North Borneo, we pass on our way up the west coast of the peninsula—the old settlement of Malacca ; Dindings, a slice carved out of Perak, including a good port, which may eventually be of considerable importance ; Province Wellesley on the coast above Perak, the northernmost of the Federated States ; and the island of Penang opposite with its well-known port.

The four Federated Malay States, on the other hand, are—Perak, in the north, running up to the level of

Penang and separated from Lower Siam by the independent states of Trengganu, Kelantan and Kedah, which have lately come under British protection; Selangor, in the centre, containing the capital, Kuála Lumpúr, and Port Swettenham, where I landed; Pahang, along the east coast; and the Negri Sembilan, in the south, including Port Dickson, from which I left on the return journey to Singapore. The southern end of the peninsula, between these states and the island of Singapore, constitutes the quasi-independent sultanate of Johore.

But neither the Federated States nor Johore or the protected states are independent of the kind British lion, who supervises their foreign relations, and has a considerable influence in the management of their internal affairs.

The Federated States have not rightly earned their title to the name, for they are not properly federated. Perak is by far the richest; and they only agree to work together and subscribe for a few common purposes, as for instance, the forests, the "Malay Guides," and their Resident-General, Sir W. T. Taylor. Each separate state is governed by an English Resident from the Straits Settlement Civil Service—cadets, as they are called. These officers appear to take the "advice" of the governor of Singapore, who is high commissioner of the Straits Settlements, and undertake to enter into no relations with foreign powers.

We have already referred in a previous chapter to the recent history of these states as it affects the native population. Their present position is of

economic interest in that they are going rapidly ahead on the strength of their tin mines and voluntary Chinese labour. They supply 70 per cent. of the world's tin, which in 1903 accounted for 72,500,000 out of their 78,500,000 dollars' worth of exports; and on this the public revenue largely depends. In other words, they are dependent for most of their wealth on Chinese labour. The conditions are very similar in many ways to those of South Africa, about which there was five years ago so much controversy, but fortunately for the Malay States their procedure was not known to the party politicians at home. Here too was a virgin country, largely covered with dense jungle, and inhabited by a race who loved a simple life, and had no desire to assist the mineral prospectors in their search for wealth.

Despite the ideals of certain sections of the community at home, the search for wealth continues, as it will always continue, to be nature's incentive for the development of new countries. The poet may rave about the natural beauties of the jungle; Mr. Ruskin might deplore the gross vulgarity of the railway; and many of us, from St. Francis down to ex-President Roosevelt, have extolled and shall continue to worship simplicity in all its forms. But nothing can blot out the fundamental principle of the struggle for existence, and, as its correlative in modern life, the struggle for luxury and wealth. This it is—although as moralists and artists we regret it—that constitutes the moving power for development of natural resources in the world at large; it is this thirst for wealth which introduced Chinese labour

into South Africa and into the Malay Peninsula, and, in the latter case, has directly resulted in an astonishing development of the natural resources and powers of the country.

The term "natural development" is used advisedly, as a convenient phrase to distinguish between the exploitation of animate and inanimate wealth. It is surely a mere convention; for there can be hardly any really greater approach to nature in growing crops and other living produce than in digging up the minerals found in the soil. Indeed, the gold or the tin or the diamonds are the natural product of the untrammelled forces of nature, while rubber, coffee, wheat, fruit and flowers, if grown with a view to their utility, are the result of the direction and perversion of nature's forces by man. The final preparation of the mineral and the final preparation of the vegetable or animal growth is in each case artificial, the product of the working of another of nature's products, the ingenious mind of man.

But granted that, through the more rapid translation into interchangeable wealth—that is, into gold coin—of work upon minerals—granted, in other words, the attraction of the latter to many who seek wealth for its own sake and are inspired by no very elegant ideals of life—we shall probably all agree that the convention which assigns to labour engaged upon the living products of nature the epithet "natural" is useful, if illogical; and we will also agree that the term carries with it a very different distinction of charm, of art, and of ease, in favour of the more easy-going pastoral pursuits. Probably

I am in a very small minority in assigning the higher reverence to those who, engaged in the pursuit of mineral wealth in all its uncomely surroundings, maintain a high standard of principle and integrity, while making the most of the mineral assets of the world.

Nevertheless, one must bow to the public view ; and as some recommendation for the untiring industry and bold resource which have developed the tin mines in the Malay States, I would submit the fact that the same qualities were also in 1904 planting rubber, coffee, tea and cocoa, right and left in places where the jungle had been, unnaturally, cleared away by the axe and by fire. Thanks to modern inventions, largely the result of modern wealth derived from the exploitation of the world's minerals, the world calls aloud for rubber ; thanks to science, far more than to the teetotalers, the world continues to call aloud for tea, cocoa and coffee. If these articles could be produced economically in the Malay Peninsula, it was conceived that an industry would have been found not only to give employment to the Malays—and employment, we are all told, is good for moral development—but also to provide a secure basis for the finances of the country, in the event, which must always be kept in view, of a possible exhaustion of the mineral wealth.

Before the days of the rubber boom this seemed a serious danger. Some of those in authority saw signs of the alluvial tin giving out within ten years and doubted if the underground mines and the gold and other minerals would be able to maintain the revenue.

This however was no reason for delay in making the most in the immediate future of the mineral deposits already known. It was probable that, during the course of active industry associated with the life of the tin mines, other minerals would be found, and petroleum was not one of the least probabilities. Many people have urged the contrary procedure in connection with the South African mines, contending that it would be better to develop them slowly, by the use of such native labour as is available in the country, in order that the agricultural and other developments of the country may march with it side by side.

But the history of the world's progress points in the opposite direction ; if I wait to shoot at goal until the other forwards are up, the opening will be lost.

A suitable analogy is supplied by scientific research. Had Darwin only worked along lines of which he saw the end, had he chosen only those particular investigations which seemed to him likely to be of immediate utility to the world, he would never have collected the vast array of facts which eventually ended in the greatest and most useful addition to knowledge that has been made in modern times. The incentive of the research worker is interest in the codification of nature ; the smallest possible anomaly may interest him, and he pursues it, not knowing in the least where the pursuit may lead him. Here is developed a vast industry of knowledge, from any corner of which at any moment results of the greatest practical value are constantly, though purely by chance, being derived. The lesson

surely to be learned is to make the most of what you have, and either yourself or by others to be constantly applying the test of utility to the result of your labours. In the case of gold no such test is needed—gold is, on the face of it and immediately, useful to the philanthropist and to the statesman, as well as to the scoundrel. Go ahead, produce it as quickly as you may, bring out your talent from the napkin, use it and put it out to usury, and you will be rewarded tenfold.

For the present, therefore, the Federated Malay States are developing themselves on the hypothesis that the tin mines will continue for some time yet to be a source of wealth to the country, and that, when they fail, other sources of revenue will have been found to maintain their advance. It is undoubtedly a risky process ; for the future of the country depends partly on chance—that is, on conditions little known—still more on the continued vigilance and industry of its own officials, and the continued commercial activity of the industrial community within its borders, inspired, if you will, by greed and other natural incentives. But nothing venture, nothing have. England would have been mere England, or less, had it not been for the ventures, for instance, of the Elizabethan navigators and explorers. The British, too, have always enjoyed their gamble in life.

The value of mineral development is well illustrated by the capital of Selangor and of the Federated States. An hour and a half up the single line of railway, hewn through dense jungle, which appears uninhabited except for an occasional clearance, com-

prising tin mines and a few surrounding huts, bring one the thirty miles from Port Swettenham to Kuála Lumpúr, a city of 35,000 inhabitants, an epitome of modern civilisation, wonderful all the more by contrast with the preceding jungle. By the census of 1901 the population was given as follows :—

Chinese . . . . .	23,181
Indians . . . . .	4,435
Malays . . . . .	3,727
Europeans . . . . .	200
Others . . . . .	838
Total . . . . .	<hr/> 32,381

In 1891 the population was only 19,020 ; ten years showed therefore an increase of 70 per cent. The town is scattered at the foot of a cluster of small, richly grassed and wooded hills, each one of which is capped by a comfortable-looking bungalow or two. The streets are broad and good, all radiating roughly from the magnificent government building, one of the best bits of modern architecture to be seen in the east. It is a long stone edifice, with a central tower—in size and line recalling the Imperial Institute—with open spiral staircases running up two flanking towers. In front of this imposing symbol of empire-building a fine grassy cricket-ground, and a white-flannelled cricket match in progress ; on various sides of it the club and the hotel, the church, the post-office, and a bandstand from which the band of a Sikh regiment was playing selections from *The Country Girl*. A town hall, municipal offices and

other commercial and public buildings were in course of erection ; a few out of the thirty motor cars licensed in the city whirled along the road ; and a motor omnibus plied over the neighbouring mountain pass. Apart from motors and private traps, the only vehicle was the ubiquitous rickshaw. The traveller and his baggage were run up by Chinese coolies in three rickshaws from the railway station to the hotel, which, judging by the private hospitality of the white man abroad, cannot carry on a very thriving trade.

I suppose it would be impossible to stay with anybody in Kuála Lumpúr who did not illustrate by his existence there the active development of the place. My own most hospitable host emphasised the scientific side of this development, Dr. Daniels having exchanged his position as tutor at the London School of Tropical Medicine—to which he has now returned—for that of director of the Institute for Medical Research at Kuála Lumpúr. This institute was originally intended for the investigation of beri-beri, with the view to its prevention. The need for it is fairly well shown in the fact that whereas by the census of 1901 the population of the Federated Malay States was 678,595, the number of deaths from beri-beri in 1900 was 1466 ; and whereas the population of the Straits Settlements was 572,249, the number of deaths from beri-beri in 1900 was 298 ; so that 1764 deaths occurred from beri-beri out of a total population of 1,250,000. If in London 7000 people died in a single year from one definite and preventible disease, it would assuredly be necessary to adopt

special measures for its investigation and prevention.

The Malay States therefore started this institute under the care of Dr. Hamilton Wright, from McGill College, Toronto. But the work of the institute has rapidly extended in other directions. Exhaustive monographs have appeared both on the subject of beri-beri and on that of malaria ; other diseases are constantly under investigation ; and a small research nursery and a glass insectorium, kept at an uncomfortably high moist heat, afford opportunity for research into the diseases of rubbers, sugar-cane, coffee, grains and fruit-trees, by the forest department ; while sheds and a paddock for cattle give opportunity for the investigation, for instance, of rinderpest.

But the most striking instance of development with a view to the future lies in the laying out of the city itself. This has been to a large extent due to the work of the president of the sanitary board, an old English public-school boy, who had spent a varied life in America, in Australia, and in Rangoon, since he, as sanitary engineer, twenty-five years earlier, laid out the streets of Kuála Lumpúr. At that time the city was in its infancy, and it required considerable foresight and perseverance, in the face of very natural opposition, to lay down the streets, 120 feet broad, which are now one of the most attractive and healthy features of the place. " Always look fifty years ahead and if possible a hundred." The president's motto for sanitary engineering, learned in Australia, applies equally well to other things

than drains and streets and to other lands than Malay.

But this motto was not known to the government of Selangor in the early days, and for want of it in 1904 they had recently had to pay 52,000 dollars for two dirty old ramshackle houses that were in the way of a new street, whereas in 1891 they would only have had to pay 3000 dollars; the whole of this street would then have only cost 25,000 instead of 150,000 dollars.

"The cost of improvements," said the president of the sanitary board, "should largely be borne by futurity." "That's all very well," said my host, "when you are sure of your futurity, but if your futurity and your tin mines give out in ten years where will you and your heavy municipal debt be then?" Here we are back at the original principle on which the Federated States have definitely decided to progress. They take this risk, and, on the strength of probabilities, make their improvements by mortgaging their future. This policy, with all its risks if carried too far, has the two great advantages that it advertises the energy of authorities, who dare, and that it ensures continuity of policy to maintain the value of property acquired and of improvements carried out. The essential qualities that it requires are those of imagination and common-sense, grounded on a wide appreciation of local resources in relation to those of the outside world.

But all the world over the pioneers and officials of sanitary reform find that they are to a large

extent crying in the wilderness. It is lamentable to see, concurrent with the growth of towns, ay, even in London in the present day, the growth of insanitary conditions which it will be most expensive to abolish, when they might have been foreseen and entirely prevented from the outset. I was taken round a quarter of the town to see some of the difficulties. The sanitary board were struggling, for instance, to keep clear a lane at the backs of houses for removal of the nightsoil and for ventilation; they were opening up blind alleys; and so far as might be they were buying up land on a large scale in advance and "bettering" it, so as to secure at the same time a sanitary town and a good investment. They had embanked one side of the river; but the embankment had been carelessly done, so as totally to prevent subsoil drainage from the neighbouring shanties, which were accordingly surrounded by puddles. The state engineer now proposed to run a drain along the embankment; but for this there was no fall, and the true remedy would be to remove the shanties, which were out of place on a massive embankment close to government buildings in a capital town.

The president of the sanitary board proposed a bigger scheme, on town-planning principles, for a fine carriage drive, with business and residential sites, along embankments on both sides of the river—the ground at the back of the new sanitary board offices to be bought at once, while fairly cheap, and the sites of bad houses to be bought up and laid out for buildings at a peppercorn rent, subject to the erec-

tion of good houses within so many years, to revert to government at the expiry of the lease. Here again he would be building boldly on futurity. The cost of the sites, the cost of the embankment, the cost of roads, sewerage and general treatment would be very large. During the period of the peppercorn rental there would be no repayment ; but if the city progressed along the lines of its recent very rapid growth those sites would in fifty years' time be of enormous value, and the investment would be amply repaid.

This question of city development is one that is constantly cropping up to all thoughtful observers in local politics and administration, both at home and in newer countries. Here in Kuála Lumpúr was a definite instance of the value of having laid out certain streets on a proper scale from the first ; and many complementary instances of economic loss from failure to do so in course of development became also apparent. In viewing the matter from that outside point of view which is the essential privilege of a traveller, there can be no doubt that the greatest economy is effected in foreseeing the probable development of a rural area into town, and in paving the way for the change on a broad scale at a considerable outlay. On the other hand, when a city is already in existence, and the population of one quarter shifts so as to turn it from a slum into a thriving commercial or residential centre, economy is again effected by taking time by the forelock and spending money in anticipation of the change, regardless of the inevitable outcry of the more timid

section of the community. "Always look fifty years ahead and if possible a hundred." This policy is well illustrated at home, as regards existing cities, by the recent opening of Kingsway in London, and, as regards the planning out of new cities, by the First Garden City Limited at Letchworth.

To take the former instance first, it is a commonplace of political speeches to deplore the vast and ever-growing municipal expenditure of the London County Council and other great municipal bodies. This is in no small degree due to the want of town-planning in early days. In half-a-century London has spent £20,000,000 on street improvements and in the clearing of 104 acres of insanitary areas; down to 1908 nearly 50,000 persons had been displaced at a net cost of nearly £3,500,000. The cost works out at £32,600 per acre or £78 per person displaced. In Leeds an area of 75 acres was cleared at a cost of £500,000 sterling; in Birmingham 93 acres at a little over £500,000.

Take as a single instance the vacant site between Aldwych and the Strand, on the north side of the Church of St. Mary-le-Strand—the central of the three "island" sites resulting from the operations for what is known as the "Strand Improvement." This site has a superficial area of 2·98 acres, and for this space the London County Council received more than one offer of ground rent varying from £52,000 to £55,000 per annum, at length closing with the French Syndicate at the higher figure. The grumblers of course complained of the delay in accepting one or other of these offers, while the valuable site was

meanwhile left unproductive ; but the County Council was looking well ahead, content with the motto, " Better late than never," and the policy has probably been a financial success, but only by comparison.

A similar carving out of the streets of Paris at enormous cost was done by Hausmann under Napoleon III. half-a-century ago, but here we see the faults as well as the virtues of our French friends. Regardless of cost, the great boulevards were constructed with a view far more to decorative effect than to utility, and so to the cost of being late in their mending was added the needless cost of extravagance in space and disregard of commercial utility, so that the burden on the ratepayers of Paris has been greater in comparison than that ever laid on metropolitan shoulders by the London County Council.

But, besides the cost of dissecting and renewing a city already fully developed in any one quarter, there is added the risk connected with the future development of the municipality which has to bear the cost. What if London should cease to grow ? What if its growth should lead to a general system of that return to the land which all in theory so much desire ? It is conceivable, with improved communications by rail and motor, telegraph, telephone and post, that factories themselves may migrate from London to the country, and carry with them a proportionate share of workmen and other dependents, with their families, and the shops, public-houses, lodging-houses and places of amusement that now depend upon their custom. Should it once be shown

to be of economic value for factories thus to migrate, the result would be a definite loss to the great towns of ratepaying force, there would be fewer to bear the burden of the improvements now being made, and those that remained would be still more heavily burdened to make up for the deficit. Our city fathers are hampered by no such fear; like the government of the Federated Malay States, like the president of the sanitary board in Kuála Lumpúr, they are building on the future. But it is well that the public should realise it.

This question of the migration of factories to the country is indeed of burning interest, for evidence is constantly accumulating to show that such migration is worth the manufacturers' while. Still more is it shown to be economical for new factories to establish themselves from the first in the country, on sites properly laid out for urban development. This principle has become publicly known as the "Garden City" movement, initiated, it is said, by Robert Owen a century ago, but brought into the domain of practical politics by a shilling book, "The Garden Cities of To-morrow," written by Ebenezer Howard in 1898. Owen proposed to found industrial villages of about a thousand inhabitants on socialistic lines, calculating that in twelve years the foundation charges would be paid off and the residents established as proprietors.

Howard proposed a Garden City of 30,000 inhabitants on trust lines, calculated to develop the whole estate in benefit for the community. The essential principle of the scheme is to accommodate

the growing demands of a residential population, such as those which are adding dozens of streets every year to the outskirts of London and other great cities. Howard's idea is to induce industries, either new or migrated from the cities, to establish themselves on such model sites as Letchworth, and so to form the nucleus of a moderate-sized city, in which the workers shall live close to their work, instead of spending two unhealthy hours every day in the train, and shall work and play, and eat and sleep, under the healthy conditions of an adapted country life, with the added benefits of neighbouring market gardens and facilities for interchange of labour between field and town.

The promoters of the Garden City movement, although for the most part professed philanthropists, are intent, for the very purposes of ulterior philanthropy, on showing that their scheme is commercially sound. The site of 3800 acres, now being actively developed at Letchworth, has in a few years increased its population of a few hundred to so many thousand, and by the end of this year the company intends to show a clean balance-sheet. If, as seems probable, it is able to follow this up by paying its retrospective and regular dividend of 5 per cent. within the next ten years, the soundness of the principle will have been proved. The next point, as with the discovery of the Röntgen rays, will be the interpretation and the results of that success.

In a way, the principle of the Garden City has been already established at Port Sunlight, outside Liverpool, and at Bournville, near Birmingham. The

former, established by Messrs. Lever Brothers for their workpeople, is engaged in the manufacture of "Sunlight" soap. The founders admit that it has been an expensive pleasure to them, for they have not tried to make it self-supporting apart from the factory, although they maintain that the sum of £10,000, representing interest on capital spent on the buildings, is a legitimate charge on the business. But Bournville, founded with no less philanthropic intentions by Mr. George Cadbury, in order to manufacture his chocolate and house both his own workers and workers in Birmingham under healthy conditions, has definitely proved itself a profitable investment, and as such has been generously handed over by Mr. Cadbury to a public trust for the good of the inhabitants. When Mr. Cadbury first started work in the Birmingham factory, over thirty years ago, 12 hands were employed. The business increased until 300 were employed, and then, further expansion being possible only at a prohibitive cost, the business was moved four miles out of Birmingham, and now employs 3400 hands. The net income of the trust, apart entirely from that of the business, is reckoned within forty years to be £20,000, and within a hundred years £160,000, while on it, for six shillings a week, including rates and taxes, a man can get a six-room cottage, and a garden by which he is able regularly to save half-a-crown a week.

The Hampstead, Ilford, Romford and Ruislip garden suburbs round London, and similar recent developments round many large towns in the United

Kingdom, are illustrations of an intermediate effort to house the people healthily ever further from their business while still working in towns.

It is evident that we are dealing in the Garden City movement with two problems—housing, and, if it may be so called, towning. It was the latter principle which was so well illustrated in Kuála Lumpúr ; it is the former that is especially illustrated in garden suburbs ; both are sought to be combined in the Garden City at Letchworth. The same problems I found in 1905 being solved on very similar lines by the representatives of Krupp, the great firm of iron-masters at Essen, in North-West Germany.

Four successive generations of the Krupp family have been interested in the social welfare of their workmen since the firm was founded in 1810, and Essen, which practically consists of Krupp's dependents, was in 1905 a town of 120,000 inhabitants. But this development has not been allowed to take place at random. Streets have been laid out according to the formation of the ground ; houses have been built to suit the varying needs of different grades of the firm's dependents, and the result is four definite and distinct "colonies," attached to the central works, developed on the healthiest and most convenient lines possible. The saving thus effected in the proper housing of their workmen by the employers themselves has very largely contributed to the financial success of the firm. The late Friedrich Krupp was one of the first philanthropists, as well as one of the most successful business men, of the German Empire, and he always insisted that, in

laying out considerable sums on the housing of his workpeople, he was insuring his business over and over again.

The proper laying out of a town is of course much facilitated by despotic powers on the part of the owners of the land. When Krupp made up his mind to lay out Essen on certain lines, no one could prevent him. So, when the Russian government decided to lay out Dalny, the port forty miles from Port Arthur, on a large scale, they too were able to do it unimpeded. Dalny in 1904 was a surprising instance of the ideal laying out of a city. A magnificent harbour was already constructed when it was taken by the Japanese in that year. Alongside this harbour were ranged the warehouses, arsenal and government buildings required for the purposes of the port and administration; but above the harbour a large extent of land was laid out for the purposes of the town and divided by roads radiating on the most mathematical plan from the church at its centre into sections to be allotted to different nationalities and classes of the population. Many residential villas had already been built on this plan on the side nearest to the harbour, and were gladly appropriated by the victors on their entry. It would be interesting to know if Japan has followed out the remainder of this scheme.

But the proper laying out of a town from its very outset is not the unique privilege of a despot or a despotic government. Adelaide, the capital of South Australia, has strictly adhered to its original plan of development in maintaining intact the park zone

outside the original city and continuing its extension on freshly laid out land beyond. In Canada again that most surprising of all cities, Winnipeg, which in the ten years before my visit in 1904 had doubled its population, and in the next ten was expected, as the great junction between East and West Canada, to become the largest city in the Dominion, had to some extent planned its development in advance. There was abundant need for prompt action, as tin shanties were being dumped down in every direction, even in the busiest streets with fine front-ages; an illustration (Plate 11) shows a potential slum, and Mr. Henry Vivian in his recent visit to Canada has found slums in the making all over the Dominion. Canada has the good fortune to have in Lord Grey a governor-general who has from the first given active support to the Garden City movement and is now engaged in preparing measures to meet the evil. But the evil exists in every developing part of the empire; the pioneers of development are too busy to pay attention to such ulterior considerations; and the mischief is being prepared, like a conjuror's trick, while their attention is diverted. There is even less reason for such neglect in an old-established colony under stable administration, as for instance in Hong-Kong, to which the next chapter is devoted.

In the most democratic of all countries, the United States of America, whether you take San Francisco in California, Chicago in Illinois, or Washington, the capital of the Republic, the principle of the proper laying out of a city is recognised as essential and indispensable. The maps of San Francisco and



Slums of Winnipeg in the Making.  
Tenanted by Galician Peasants.



Chicago, divided into hundreds of rectangular blocks of equal size, are proverbial, and the map of New York, with its eleven "Avenues," intersected at right angles by 160 odd "Streets," is far more like a diagram than a map. But there can be no doubt as to the health and the convenience of this arrangement; and straight lines lend themselves almost as much to fine architectural treatment, if the artists must be pleased, as the irregular and crooked streets hated by the sanitarian as well as by the business man, while as for magnificence no one can dispute the pre-eminence of Washington, the city of magnificent distances, laid out with broad avenues radiating from the finely situated Capitol, designed, be it said, by a French officer of Engineers in the eighteenth century.

Chicago was rebuilt on its present lines after the great and most beneficial fire of 1871, which did £40,000,000 worth of damage, and left 100,000 people homeless. A similar most destructive fire in the city of Baltimore, a few months before I visited it, had already been turned to good account in the reconstruction along new lines of the affected quarter.

We suffer now in London from the fact that the city was rebuilt after the great fire in the seventeenth century in neglect of Christopher Wren's plan and without regard even to probable development. It should be borne in mind that expense incurred wisely in the housing and towning of a population will not only promote the amenity, convenience, rapidity of communication and conditions ensuring the public health and prevention of disease, but will

always be restrained by the instinctive business wisdom of our people, which is often given far too free play, and will in the end be a good business investment.

The principles of the Garden City Association are making headway. Sixteen estates covering 8380 acres have now been laid out on these lines, varying in size from 53 acres at Harborne to 3818 at Letchworth. Birmingham in addition has scheduled nearly 4000 acres in its town-planning schemes, while the Ruislip Northwood scheme in Middlesex covers 6000 acres. Other big schemes are being undertaken in connection with the new Doncaster district coalfield; the new naval station of Rosyth with Dunfermline; Barassie near Troon on the Clyde; Greenock; Gourock and Edinburgh.

It is to be hoped then that in the future, however tardily, we may follow in the reconstruction of our cities or quarters of cities, whenever we get the chance, the examples of sound towning brought into public notice at the recent town-planning conference and exhibition; still more that we may put a limit to the inordinate growth of cities, which deprive man of his individuality and make him a mere nut or screw in the machine, by promoting the plantation of industry in healthy surroundings and the growth of garden cities and industrial villages rather than of mere residential suburbs, with a view to "colonisation" of the country in keeping with modern developments. Do not let timidity be mistaken for economic wisdom; be bold; "Always look fifty years ahead and if possible a hundred."

## CHAPTER VIII

### HOUSING AND THE FUTURE OF HONG-KONG

HONG-KONG is a concrete instance of the urgent need for a housing scheme on a large scale, with a view to futurity. It is indeed about as good an instance as the most ardent sanitary reformer could desire. The need for it is obvious ; the main lines of the required reform can be imagined without difficulty ; a definite scheme is easily conceivable, and the means by which to attain it are within our grasp, so long as Hong-Kong remains a Crown colony.

The need for it is obvious. It was the plague outbreak in Hong-Kong in 1894 that first brought the unwelcome reminder to the western world that bubonic plague did not become extinct in 1666. Since 1894 plague has spread far and wide over the globe, and claimed its 7,000,000 victims in India alone ; but it has not yet lost its hold upon Hong-Kong. In the year 1894, 2833 cases of plague were reported ; 2550 died. The numbers of deaths in successive years following were : 36, 1079, 19, 1175, 1434, 1022, 1562, 559, 1242 in 1903, and so on, with a total of 11,093 up to the end of 1910. This in a population, boats included, new territory excluded, of under 350,000 is a very serious mortality, and for the sake of the people themselves requires urgent attention.

But the need for urgent measures is still greater when we consider the commercial effect of plague in Hong-Kong. Hong-Kong is the port of call, the great centre, for all sea-borne traffic between Europe, Africa and India, on the one hand, the far east and America on the other. The volume of trade passing through Hong-Kong is increasing yearly, and it will probably increase at a still greater rate in 1915 when the Panama Canal is opened as a rival to the Suez route for traffic from Western Europe and the United States to Asia. Epidemics follow trade routes—the history of the plague is a patent example of the fact—and plague at Hong-Kong is liable to be distributed throughout the greater part of the world by direct communication.

This danger is so real that the port of Hong-Kong is declared infected, whenever plague is epidemic there, and vessels thence subjected to protective regulations, if not to actual quarantine, at Japanese, French and other ports. During my stay for instance at Hong-Kong a ship laden with passengers and cargo returned from Saigon, having been turned back at a clear loss to her owners of £1000.

The danger is all the more serious on account of the close connection between Hong-Kong and South China. Hong-Kong is the commercial *dépôt* of South China; practically all the trade between Canton, the only port of importance in South China, and the outer world, is carried on through Hong-Kong, which has been suggestively called its suburb, eighty miles off. Half-a-million of people pass each way between Canton and Hong-Kong annually, and some

four thousand river steamers and eight thousand junks annually enter the port of Hong-Kong from the Canton and West River district. In 1894 the plague infection was brought to Hong-Kong from the mainland, where it had been raging in a number of localities, although no opinion on the subject had been forthcoming from the Chinese authorities. Since then there is sufficient evidence to show that plague cannot have been conveyed in any other way to Japan, Australia or America, and it is almost certain that the 7,000,000 deaths in India were due to infection imported by sea from Hong-Kong.

This instance of the ravages of plague may form the basis of some observations as to the general need for rehousing of the poorer parts of the population, whom I may briefly call the poorer Chinese, in this small but important colony. Hong-Kong has been the kitchen which has sent out death and has damaged commerce for sixteen years throughout the civilised world, and the cooking-pot is the Chinese quarter of the city of Victoria. It is hardly too much to say that, if the grossly insanitary conditions of this square mile or so of the earth's surface were to be abolished, the greatest danger to the world of future epidemics of plague would be entirely averted.

But to a visitor, and above all to a health officer, making a tour of the Chinese dwellings in Hong-Kong, there was no need for an outbreak of plague to emphasise the need for sanitary reform. The acting medical officer of health for the colony took me round some of the worst streets and into several of the most typical dwellings.

Hitherto the Chinese have built deep and high houses on very narrow frontages, and each floor is divided up into cubicles, most of which are devoid of light. Here were "box-dwellers" with a vengeance.

One house, for instance, which we visited, in the slums, gave us entrance up a very narrow staircase. The first floor was divided into six cubicles by wooden match-boarded partitions, only the front cubicle being lighted from the front windows, while the rest had only diffused light coming over the top of the cubicle partitions from a side window in the passage and from a window into the air-shaft at the back. The rent for each cubicle was 4 dollars a month, averaging  $3\frac{1}{2}$ d. a night, or as much as a bed in London. The lessee of this storey earned therefore 24 dollars a month, as against the 15 dollars' rent he had to pay, besides housing himself for nothing, and letting out planks in the passage at one or two cents a night to casual lodgers. The back of each house in this street opened on to an air-well, so-called; but the air-well was nearly covered in by a roof, and encroached on by kitchens built out on each floor. In most of the ten health districts into which the city of Victoria is divided, the average number of persons per floor was from 7 to 9; the average number of persons per house was from 20 to 25; and in half the districts the average number of persons per acre, on areas built over, was over 450, actually rising in one locality to 982. I cannot ascertain any other city in the world which averages for its whole area as many as 132 persons to the acre, and yet this was the density of the population

of the city of Victoria, including all the outlying vacant lands and villages, racecourses, cemeteries, and public gardens. Glasgow, which is the most densely crowded of the large cities of the United Kingdom, is dissatisfied with its 61, London with its 60 persons to the acre. Even the overcrowded parish of St Matthew, Bethnal Green, twenty years ago had only 168 to the acre.

Moreover these terrible conditions in Hong-Kong are not growing appreciably better with the increase of population. Between the censuses of 1896 and 1901 the average number of persons per acre had increased from 117·4 to 129·3; the last annual report, for 1909, shows an increase on the previous year of persons per floor from 6·7 to 6·9, per dwelling from 20·1 to 20·5, per acre built over from 247 to 255; and there is no doubt that the increase will continue unless arbitrarily stopped. This is a nice condition for one of the chief centres of the world's commerce, in frequent and close contact with China, the home of all the plagues!

The government of Hong-Kong have realised to some extent the importance of the housing problem, and passed in 1903 a new Public Health and Buildings Ordinance, which they have since amended in a few minor points. By degrees the worst conditions are being improved, and the new ordinance enforced. At the time of my visit the medical officers of health and their twenty-two inspectors were insisting on cubicles being mere partitions, and not lath and plaster walls; these were to be clear of the floor, and not to reach within 4 feet of the ceiling above;

the minimum floor space was to be 64 square feet ; only one occupant was allowed in each, unless it had windows in front and rear, and then only two were allowed ; windows had to measure one-tenth of the floor area, one-half of the window being glazed and one-half being made to open. On this point they were at the time of my visit insisting universally on a beginning being made—every occupant was to have 50 square feet of floor space, and 550 cubic feet as a minimum of air space, 1000 cubic feet being the minimum for all but servants in the hill districts, which are mostly occupied by Europeans.

But of course the houses still remained, just as deep and dark behind and just as high, in streets still as narrow as ever. For new buildings, indeed, the plans of which would have to be passed by the medical officer of health, the most complete details seem to have been laid down. They were limited to four storeys and 76 feet in height, and they must not be more than half as high again as the street is wide. Sanitary provisions were made against damp, fire and rain ; the streets were not to be under 30 feet broad in the city ; back lanes, 6 feet wide, were to be left for scavenging ; yards to be provided equal to one-third of the area of the building ; and windows, 10 square feet and glazed, to be inserted fore and aft on every floor.

Housing reform, however, is notoriously costly, difficult and unsatisfactory, and on these old-fashioned lines it supplies no real solution to the problem of properly housing an increasing population on a limited space. No houses were old enough to

be condemned on score of age ; and to condemn one for faulty construction would be to condemn all. Window space and cubicle regulations, even provisions for new houses are the mere mint and cumin of the law. The weightier matters appear to be omitted.

With such high buildings it would seem a mistake not to insist on much more open space and on broad streets at frequent intervals, for the sake of health, even if unnecessary for the traffic, which consists only of rickshaws and pedestrians. Land, as in London, was extremely valuable, running up to 30 dollars (54s.) a square foot in the centre ; but the revenue of the colony was in a very flourishing condition, that for 1902 amounting to nearly 5,000,000 dollars, an increase of nearly 700,000 dollars on the previous year, while its debt was only £341,800 sterling, and the financial position has improved considerably since then. The government were proposing to " resume " the most insanitary areas under a trust, and this undoubtedly would be a good measure if it were carried through vigorously and to completion within the next few years ; but, in the absence of any further room for building in the present city, they were piling and filling in an area on the west side of Quarry Bay, to be reclaimed from the sea on the eastern outskirts of the city, with the view to the housing there of more Chinese. Considering the enormous expense involved this seemed a radical mistake.

The real solution of the problem would seem undoubtedly to be a development on a large scale of

the British territory on the opposite side of the harbour. In India, for the prevention of plague on a large scale, in dealing with the uneducated native only one measure proved effective—namely, total evacuation of an infected village or quarter; and that measure was almost invariably and completely effective when it could be thoroughly carried out. If therefore a permanent migration of the poorer Chinese from Hong-Kong across the water to the mainland on the other side of the harbour could be effected, new quarters being constructed for them and maintained under healthy conditions, there was good reason to believe that plague would be for the first time under control.

The harbour of Hong-Kong is an arm of the sea dividing 300 square miles of British territory on the mainland, including the peninsular and Chinese city of Kowloon, from 30 square miles on the island of Hong-Kong, which contains the city of Victoria and comprises half the whole population of the colony. This harbour is some 10 square miles in area, varying in breadth down to  $1\frac{1}{3}$  miles at its centre, so that communication from the city to the mainland should not be very difficult.

When we came in from Saigon on 20th May 1904, with the south-west monsoon, terribly hot and sultry, behind us, the conditions were against enthusiasm; but there was no doubt that the entrance to the harbour was magnificent. We came in from the west. On our right were the city and docks, facing the harbour, on the north side of the bulky little island, 10 miles by 4, whose well-wooded sides sloped

from the Peak, 1774 feet high, and other green-covered mountains, most abruptly down to the water all round the island. It was hardly conceivable that there was a town as big as Newcastle-on-Tyne between the foot of these mountains and the water.

But the mainland, to our left, was also British territory, with a long row of reddish mountains, sloping down more gently towards the seashore and leaving a large tract of country between mountains and harbour awaiting development. This country and these mountains were in 1898 acquired by the British government, in order to secure the safety of the harbour from any attack from the mainland. The limit of British territory is a line between Mirs Bay on the east and Deep Bay on the west behind the range of mountains; and with heavy batteries at either mouth of the harbour, Hong-Kong could probably, even in the absence of the fleet, be defended by land forces. The promontory of Kowloon, which until 1898 was all that we possessed on the north side of the harbour, is perfectly flat, and some 3 square miles in area. The population of this new territory at the census of 1901 was 85,000, apart from the 75,000 in Kowloon City, which is at the base of the promontory and 4 miles by water from Victoria.

A clumsy flat-bottomed "sampan" with sails and oars took me off to the wharf, three rickshaws ran me and my luggage along the row of great "godowns" or warehouses; along a busy street of five- or six-storeyed houses, their ground floors occupied by shops with flaming vertical signboards, describing

their business in bold picturesque Chinese characters ; up the steep battery-path ; past the cheap-looking stucco cathedral, to the station of the mountain railway. From here a cable car, worked by an engine at the top, took me in eight minutes 1200 feet up to the Victoria Gap, in which is built the Peak Hotel, looking Janus-like across the sea, both west and north-east. The view as one rises is magnificent—the city spreading itself out down the side of the mountain, with houses cut into its side, reservoirs of brown or pea-green coloured water, and a few tennis courts, with midgets playing about on them, seen in miniature far below ; a sharp line of wharves, broken only by the Blake Pier and Naval Dock ; the harbour, studded with junks and sampans and steamers, so close together that it was hard to find a berth for our *Telemachus*, where she could be safe against swinging her stern round against that of the *Poh-an* on one side and the *Sishan* on the other ; across the water the busy promontory of Kowloon, fringed with warehouses, dominated by barracks for a couple of Indian regiments and buttoned up at its neck by the native Kowloon City ; the whole scene backed by the distant ruddy-brown mountains, glowing with the brilliant golden-yellows of a sun sinking to its setting. Such was the scene before which I had tea on the terrace, and cooled in the delicious breeze sighing under the Peak. Then, after sunset, empire turned into fairyland ; electric light shone up in a few bright spots from the darkness of the city ; lesser lights distinguished the houses from the trees ; every steamer,

junk and sampan showed a quiet yellow fairy lamp on the water ; and across the harbour the Kowloon shore was lit up, fringed with a delicate chain of pearls.

There, it seemed, was the solution of the problem. Kowloon and the mainland must be developed into a business and residential city for the Chinese, and the slums of the island gradually abandoned. The policy of the government should definitely aim at the migration over water of the poorer Chinese. To this end the *vis a fronte* must be combined with the *vis a tergo*, attraction to the new quarter with quiet but firm compulsion out of the old, the second being only applied in inverse ratio to the success of the first factor. If the policy of attraction be successful, there will be no need to do more than firmly and surely to apply the present regulations under the new ordinance in vogue in the city of Victoria. The counterpart of the policy of attraction to Kowloon—namely, the discouragement of residence in Hong-Kong—is a subject that requires local knowledge ; but it should not be difficult to find some measures which would reduce the attractiveness of Hong-Kong for the coolie, such, for instance, as raising the licences of houses of entertainment, and enforcing the law more rigidly against restaurants and shops in the poor quarter. Such measures would greatly assist the success of Kowloon in the struggle for the custom of the Chinese lodger.

If the new regulations as to streets and buildings be properly enforced, there is no room available near enough to their work for the accommodation of poor

Chinese in the island. The gain of any sites that may be furnished by costly reclamation must eventually be more than counterbalanced by the extra need there will be of sites for European residences, go-downs and offices, the new university, official buildings, and shops. Even the new tramways will not induce poor Chinese to live in any considerable numbers on the unoccupied lands east of the city, if only on account of the expense of transit ; nor is it desirable that a Chinese city should grow up in that direction. As the need for further Chinese labour grows, more Chinese will be packed into the overcrowded quarters of the city, and it will be more difficult than ever to enforce proper sanitary regulations.

On the mainland, on the contrary, is a practically limitless site, on which a large city, perhaps of 500,000 inhabitants, is likely to grow up within the next fifty or sixty years. If this large population be allowed to amass itself haphazard, very similar conditions will grow up as are now responsible for the continuance of plague in Hong-Kong, and combative measures will be, as now, immensely costly, immensely difficult, and, broadly speaking, quite ineffective. The government should therefore focus their attention, not on the slums of Hong-Kong, but on the peninsula and the new territory on the mainland. It is on the growth of the new city of Kowloon that the plague, on the one hand, and the prosperity of the colony on the other, entirely depend. Although it is objected that the Chinese are too conservative to leave the quarters in which they have grown up, or have at least passed many years of their

working lives, it would seem enough to realise that the city of Victoria is the product of only half-a-century's growth, and that the general experience of treaty ports is that the poor Chinese will go where they can live most cheaply. The whole success of the policy depends therefore on healthy quarters being provided for poor Chinese on the Kowloon side at a smaller cost, transit included, than their present quarters in Hong-Kong. If this be impossible, then the cheapest present quarters must be stamped out immediately, compulsorily and completely, at all costs, so that the new accommodation should not have the unfair competition of quarters that are cheap only at the expense of the public safety. But without any such compulsion it would be possible for the government to devise a cheap and healthy lodging, with the advice of representative proprietors, builders and tenants, as well as that of the health officers and others of experience in the administration.

For this purpose, where the coolie would gladly sleep in the open air, all that seemed needed was that he should be screened from view and sheltered from rain during the night. He required none of the other purposes of a house. Even the model tenements, already in 1904 occupied and said to be overcrowded in Kowloon, provided such other luxuries as solidity, permanence, stuffiness and resistance to fire, for which the tenant has to pay. Moreover, walls of Chinese brick were apt to become absolute rat-warrens, rendering disinfection useless. Rats were often found back in a house within three or four days of thorough

disinfection and fumigation. It should be considered whether it would not be advisable not only to allow but to encourage the coolie to sleep in the open air under proper restrictions. There is little danger of plague infection amongst those sleeping out of doors.

If the government made certain limited reservations of land in convenient spots, fenced in with bamboo, appropriately floored and provided with sheds, coolies would sleep there under the healthiest possible conditions, whenever hard pressed for money, instead of overcrowding the worst-managed houses where they may be able to secure a night's lodging on the stairway, or in the passages for a fraction of a cent. This would add considerable strength to the policy of attraction to Kowloon. It would be worth while too to consider the advisability of erecting houses in light reinforced concrete or in the Japanese style of bamboo and paper, which are very cheap, easily erected, and as easily burned down and re-erected at very slight cost. Information on this subject should be obtained from Japan and, if found desirable, either the services should be engaged of Japanese artisans and of some authority on Japanese building, or else facilities should be given to Japanese contractors to undertake the work. It may be suggested that the experiment be made without delay on a sufficiently large scale and under sufficiently varied conditions to enable conclusions to be drawn within one or two years on their respective merits—above all, in attracting the coolie.

It is said that such flimsy buildings would not

stand the typhoons prevalent at certain periods of the year in Hong-Kong ; but it would seem possible, if so, to devise some method of strengthening the building sufficiently for the purpose, without necessitating costly building in brick and mortar. It is urged again in objection that the Chinese have never been used to such buildings, and would not make any use of them. There is no doubt that habit and instinct are amongst the strongest factors, amongst the greatest difficulties, which an administrator has to meet in adapting modern civilisation to the use of a native population. But the strongest instinct of all in the Chinese coolie would seem to be the lust of economy ; and if his desire for gain has not prevented his leaving his home, and in fifty years making out of Hong-Kong a colony of 323,000 Chinese inhabitants, apart from the new territory, it would seem equally possible that, with proper encouragement from the government, he will not refrain from sacrificing his instincts for a brick building, if something far cheaper were provided.

In a small way this migration is already taking place ; the census of 1906 showed 1800 fewer Chinese in Victoria and 9000 more in " Old " Kowloon. One would like to know whether sufficient steps have been taken to secure proper housing conditions for these new immigrants to Kowloon. If not, they constitute an increasing danger to the colony and a new focus for the germination of plague.

To give strength to this policy of attraction one might suggest, after the example of Kuála Lumpúr, that the government, while retaining possession of

the land, should grant leases to contractors and builders at peppercorn rent for the first time of leasing. It would then be possible for them to erect cheap buildings, answering to all the requirements of sanitation, and to sublet them on such terms as successfully to compete with the unhealthy districts in the city of Victoria. At the end of the first term of lease, which must and need only be of short duration—say, ten years—the lease might be put up to auction and disposed of to the highest bidder, a 10 per cent. option being given to the holder for renewal, improvements and buildings being included in valuation. The government would then find themselves in possession of a valuable property giving an annual return, while still able to insist on improvements or actual demolition and reconstruction of buildings before renewal of lease, should experience or the growth of knowledge make it desirable. Under no circumstances should the government part with the freehold, which gives them a most powerful lever for use in sanitary matters. The arguments against land nationalisation at home lose most of their force in a Crown colony. Special terms would at first be given for the establishment of such legitimate public attractions as joss-houses, theatres, eating-places and shops. At the same time a free and frequent service of ferries from Kowloon to Victoria and back should be provided in the early morning and late afternoon, at government cost, to take the coolies to and from their work. These ferries should run from the coolie quarter itself, probably on the west of the peninsula towards

Yaumati, to the centre of the wharves, so as to carry the men practically from door to door.

I have never been able to see the objections to public authorities providing free way over the water in the same way that they provide roads at the public cost over land. If a bridge is built across a river it is done at the public expense, and toll-gates are a thing of the past. If the scheme for a bridge, which has been mooted at Hong-Kong, be impossible, it surely would be equally to the advantage of the government of the colony to supply a free ferry across the water at probably lesser cost, including running expenses, than it would take to build and maintain a bridge. In fact, the London County Council's free ferry between North and South Woolwich supplies an instance in point. The chief difficulty in inducing the Chinese coolie to live over on the north side of the harbour of Hong-Kong, two miles away from his work, would then disappear.

The reader will observe that the spirit of the Garden City inspires these schemes at every turn. Indeed it seems to me an essential duty of governments all the world over to make use of the advantage given them by their knowledge and by their power to take an active part in the development, on a proper plan, of sites, in which the public interest is particularly concerned, in the absence of that great public benefactor, the speculative builder. Considering the future of the port of Hong-Kong as assured, it is necessary to its welfare that the new city on the north side of the harbour be allowed to grow up only according to a prearranged plan, so as

to avoid the otherwise inevitable expense of broadening streets, buying up and demolishing houses for the sake of public improvement, and the expense, difficulty and unsatisfactory results of changing the nature of whole districts as the call for increased wharfage, railway sidings, factories or workmen's accommodation becomes felt.

Upon the experience of most modern American and Australian cities, and of the several other instances quoted in a former chapter, an efficient and representative committee should undertake within six months to lay down complete plans, both final and transitional, for the development of the new city for a population of at least 500,000 persons. On that basis streets should be marked out, and from the first retained for that purpose; the sites of parks, chief public buildings and institutions determined; and the general situation and delimitation decided of wharves and railways, of warehousing, manufacturing and commercial quarters, of residential districts for poor Chinese, for seafaring and artisan Europeans and for the wealthier population. Terms of lease should be settled accordingly, the strictest regard being had to the continual need for expansion and to the paramount importance of extended lines of communication by electric car, rail and boat, both with the mainland and with the island. Methods of communication should from the first be established and run even at a loss comparable with that involved in the making of roads in any city or district in the world, from the days of the Roman Empire up to the present time.

The matter presses, for the government have now to take into consideration the railway, 112 miles long, from Canton to Kowloon, for which they had already had the concession for four years before my visit, and done nothing.

Construction was started in 1906; in 1910 the British section of 23 miles was opened for traffic; and of the 89 miles in Chinese territory 35 miles are now in operation. This railway should bring by degrees all the export trade of South China to Kowloon, the only competition being that of the junk and steamer traffic down the 80 somewhat perilous miles of the Canton River. Before this railway is complete, plans for the development of Kowloon should have been definitely determined and initiated. These measures, it is hoped, would destroy the "cooking-pot," and prevent either Hong-Kong or Kowloon ever again being the centre for the germination as well as for the dissemination of plague to the whole world.

But Hong-Kong will always be liable to be infected from China, where sanitary conditions are not likely to be introduced within the lifetime of present living men. For the security and welfare of the port it is therefore also necessary to take measures to prevent, so far as is possible, the introduction of plague from China. The extent to which this introduction takes place is astonishing. At present the authorities profess an utter inability to prevent the entrance of plague from the mainland. Even if they examined every person on every boat entering the harbour, the sampans, they declare,

would get into the island, somewhere along the coast, at night, if necessary. In 1900 no fewer than 412 dead bodies, all plague cases, were found in the streets or floating in the harbour, the latter affording an easy method of disposing of concealed cases, especially for a large section of the population who live on junks in the harbour—over 46,000 in 1909. The Chinaman hates dealing with his dead—the corpse is occupied by a devil, and it is best to keep out of his way. It is therefore believed that a certain number of moribund if not actually dead Chinese are dumped upon the island.

Effective measures should in any case be taken to prevent the introduction of imported disease. This has been done with fair success in Japan, despite the constant importation of disease from Corea and China. Singapore is another instance of a well-managed port into which plague has been imported every year since 1896 without ever being allowed to spread. A rough scheme may easily be suggested. None but licensed craft should be allowed to ply or stay in the harbour, none should be allowed to touch at any other spot in the island without first going into harbour, and none should be inhabited at night except under special permit. The licensed boats would be under constant supervision by the port officer of health, who would thus be in a position to control the arrival of any infected cases. The reputed scandal of dead and dying bodies being dumped down on the island from the mainland, if substantiated, could be properly prevented by a nocturnal police launch, with the co-operation at all

points of the police on shore. To secure proper policing of the harbour it should be closed from sunset to sunrise by a steam launch patrol, enforced if need be by a barbed wire boom at either end, with police boat and shore police at other possible landing-points. The relative position of the health officers of the port and colony must be definitely determined, so as to ensure their co-operation on a single course of action.

Infection also from the secreted clothes of dead people appears at present to be a possible factor of importance in the spread of disease, and must be prevented.

As to the building of coolie quarters at Kowloon, it would be well so to arrange them as to make exit possible only through one or two streets, giving control over residents, rats and goods escaping from the quarter, in case it should be found desirable to burn it down for suppression of plague. The isolation of each block might be completed by running round it a barbed-wire entanglement on the outside of an open cemented channel on the ostensible pretext of protection from burglary. Barbed wire might also be introduced by regulation into the construction of light buildings, so as to remove the fear of burglary, which supplies a real reason, both in China and Japan, for complete closure of houses at night.

It would be well to limit these houses to two floors. The ground floor of every house should be raised, as in the houses I saw being built in Rangoon, two feet above ground-level, the intervening space being kept open, as ensured by constant inspection by day and

night and by the frequent use of the street hose for cleansing this space. No house should be constructed without its plans having been sanctioned by the sanitary authority as designed to fit in with the system of surface drainage, which must be laid down with a good flow, before building in any street is begun. In Rangoon, much of which is built on reclaimed land and is perfectly flat, the necessary gradient is secured by the help of a pneumatic system. No hollows capable of holding stagnant water should be allowed to remain.

Overcrowding is the greatest possible evil in Hong-Kong ; as many as eighteen individuals have already been found in a single room of one of the new "model" tenements at Kowloon. It could and should be rigidly prevented by nocturnal police raids and mufti inspections, with the imposition of penalties severe enough to make it not worth the proprietor's while, as in a recent case, to incur it for the thirtieth, or even for a single time. In the lodging-houses in the slums of the city of Victoria a number in large Roman and in Chinese figures is painted up by the entrance, to signify the number of lodgers for which the house is licensed. There is then no further excuse for overcrowding, if unexpected inspections are properly carried out. But the magistrates in Hong-Kong evidently do not realise the grave importance of this question of overcrowding ; they are loth to convict, and still more loth to impose an effective penalty. It is evident that this must be altered; otherwise the law is brought into ridicule, and housing reform is impossible.

The clearing out of plague-infected areas must be on a sufficiently large scale to be of any value, and must be comprehensive and progressive in a definite geographical order—say, from east to west—so as not to admit of return cases in any area immediately after clearance. This plan is facilitated by the rectangular arrangement of the streets in Hong-Kong. Accommodation must be provided for the displaced population during burning and reconstructing—as for instance in the way proposed by the medical officer of health for Bombay—in mat sheds on large permanent rafts. It must be recognised that the ideal form of disinfection is the complete destruction of a quarter by fire, coupled with a barbed-wire and trench barrier round the whole area to be burned, so as to prevent the escape of rats and other living carriers of infection, both large and small. The great fire of London once for all stamped the plague out of the city; it is to the advantage of the community, not to its detriment, that conflagrations in the poorer quarters should take place. All the usual clauses, accordingly, with the view to making buildings fireproof, should be cut out of the building regulations. There should be no objection to this policy on the part of the fire insurance companies, so long as they are taken into consultation in sufficient time to adapt their rates to the new risk of fire. Every interest likely to be injured by the proposed policy should be discovered, consulted and dealt with on liberal terms, in order that the colony may unite in a determined effort to stamp out the disease on the above lines.

The building of new houses one by one in old quarters, as in old Kowloon City, with its 12,000 slum inhabitants, is as the filling of old bottles with new wine. Kowloon City is a plague-spot threatening the whole success of any scheme for the stamping out of the disease, and it should be wiped out within two years. A two-years' notice of intention to burn down the city would avoid most of the expected difficulty. If preferred, the burning might be done piecemeal, with the use of barbed-wire fences on the analogy of the driving tactics which brought the South African war to a conclusion.

The expense of all such undertakings might well be borne by a colonial loan, floated locally on government security. There is no doubt the money could be obtained at easy rates, without any recourse being had to the London market, which might involve financial loss from depreciation of silver and loss of support from public opinion owing to lack of local liability. Considering the immense interests at stake and the exceptionally secure prospects of the colony, a large outlay of money at first would be entirely justified, so long as it were made comprehensively and promptly, in conformity with a complete scheme framed with regard both to the present and the future outlook. The complete policy of the government should be publicly explained, both officially and unofficially, in order to win the confidence of all thoughtful members of the community, and the co-operation of the public, in vigorously assisting to make Kowloon the only future residence of the poor Chinese. Hong-Kong is and should remain one of

the brightest stars in the British Crown, a guarantee for the preservation in the Far East, so far as Great Britain can secure it, of commercial efficiency, tempered by justice, wisdom and humanity.

These suggestions were formulated on the journey from Japan to San Francisco, in response to a semi-official invitation to that effect, and were sent back to the principal civil medical officer of Hong-Kong for respectful submission to the new governor, Sir Matthew Nathan, who was then succeeding Sir Henry Blake in office. The colonial secretary, on the governor's behalf, politely acknowledged the receipt of the memorandum, and concluded his letter by saying: "With your main idea, that the poorer Chinese should be induced to leave Victoria and live at Kowloon, His Excellency is in thorough accord."

The more technical criticism, which was especially welcome, came from the principal civil medical officer, whose position in Hong-Kong is recognised by a seat on the Legislative Council of the colony, and who had shown me much kindness during my visit. "I am with you," he says, "as regards the advisability of regularly mapping out Kowloon now before it is too late. I doubt though whether the Public Works Department have sufficient staff to undertake the work.

"The question of resuming the infected areas in Victoria is one of finance. The government have already commenced this, and have this year resumed Kan-u-fong, one of the most insanitary areas, and a certain sum of money is to be provided in the estimates every year for this purpose. Theoretically it

would be better, were it possible, to do this, as it were, altogether and as soon as possible, but it would not be practicable ; the resumption of Tipingshang in 1895, a comparatively small area, cost the government 1,000,000 dollars in compensation.

“ Jap-built houses would never stand the rains we have in the summer months. In forty-eight hours we had eleven inches of rainfall last July, and the typhoons would sweep them away. The Chinese labourers are very averse to living away from their work, and I fear could not be persuaded to live at Kowloon. Many of them must do so, as the enforcement of the overcrowding and cubical sections of the new ordinance is driving them from Victoria.

“ I think we must trust to a thorough cleansing of the Chinese tenement houses in the winter months<sup>1</sup> as our sheet anchor. This year we have only had 500 cases of plague in all, as against 1400 in 1903, and the Chinese, as you know, for the first time, last winter thoroughly co-operated with us in this cleansing.

“ The prevention of imported cases is a very difficult one. We should require a land frontier guard, as well as a harbour one. Then again there is the south side of the island, which would have to be watched.”

Sir Patrick Manson, Medical Adviser to the Colonial Office, and one of the greatest living authorities on tropical medicine, was himself for several years in practice at Hong-Kong. His own objections to the

<sup>1</sup> Plague in Hong-Kong, curiously enough, is most prevalent in the summer months, whereas in India it is in the summer months that plague dies out.

suggestions I have made were based on the same grounds as those of Dr. Atkinson, that Japanese-built houses could never take the place of brick for the accommodation of the conservative Chinese labourer, and that no scheme, mine or other, could prevent the importation of cases into Hong-Kong from Canton and Southern China.

These weighty opinions suggest that the only difficulties in the way of my scheme are: firstly, the construction of cheap houses, so as to withstand the climatic conditions; secondly, the prejudice of the Chinese against anything new; and thirdly, the difficulties of administration. It would seem that the details of construction could be met by the ingenuity of Japanese or other enterprising builders, whose advice might be enlisted; the prejudice of the Chinese, there can be little doubt, would be entirely overcome by cheapness, if there were one "cash" to be gained by the exchange; and the question of administration is one with which I believe an active and vigorous administrator, if so determined, would not be unable to cope. It is to be hoped that Sir Frederick Lugard, at the end of his term of office, may be able to boast of having exterminated the plague, of having laid out the promontory of Kowloon and its surroundings on the most admirable lines, and of having so secured the future health of the working community in a British colony destined to be one of the greatest centres of the world's commerce.

## CHAPTER IX

### SCHOOLS AND PUBLIC HEALTH IN JAPAN

EVERY steamer arriving in Japan from Shanghai and the south touches first at Nagasaki, the south-westernmost port in Japan, on the open sea facing China. We stopped there for a few hours, and after being inspected at seven o'clock in the morning by a couple of polite little Japanese doctors, some of us put ashore in a launch, to satisfy our intense curiosity in this wonderful country.

Walking five miles across the neck of a promontory, through typical Japanese rural scenery, we passed on the way a little village school, and, hovering about the windows, were warmly invited inside by the headmaster. It was somewhat surprising to find that such a village school, right out in the country, was almost a replica of what may be seen anywhere in England—under the best conditions—done into Japanese. The building was in the modern Japanese style, plain, spacious, clean, airy and flimsy, being constructed of wood, and probably very cold in the fairly severe winters which Japan, like England, enjoys. Each room occupied the whole breadth of the building, with large windows on either side open to a considerable extent, giving plenty of light and through-ventilation ; at one end

a blackboard and a few maps ; on the wall a few diagrams, quite intelligible to the English eye, and a few sentences in Japanese characters ; a daïs ; a table ; and a Japanese master—or in one room a mistress—in native costume, with sandals on the feet and a pointer in the hand ; down the room long rows of double desks, occupied by little Japanese boys and girls, with text-books in their own language but in European form.

They were the same boys and girls as you may see anywhere in England, only translated into the likeness of the Far East. We watched them at their work for a few minutes ; to translate into English—Tommy Smith would rise to order, and sing out haltingly a few lines from a book, while Johnny Binns and Freddy Timms pinched each other, and Billy Jones looked out of the window until forcibly reminded of his master's presence. In this little village school there were four hundred children in five classes, in as many different rooms, drawn from all the countryside, and it was easy to understand how the lower classes of Japan in the present generation are growing up at least equally well educated to our own, being given by a proper system of state-provided education every opportunity for development according to their individual talents and positions.

The system of education is most complete. Elementary, secondary and higher education are all under a single department of state, methodically organised on a single rule for the whole country. The only exceptions are Formosa, which has a separate system under the governor-general of For-

mosa ; the Nobles' and Peeresses' Schools, under the department of the imperial household ; and certain technical schools, under the departments of the army and navy, agriculture and commerce, communications and the interior. The minister of state for education is responsible for and controls, with the help of a considerable staff, all affairs connected with education. Inspection is carried out by five inspectors for the whole country, except Formosa, each having his appointed circuit. Under the minister of state, a superior council of education was organised in 1896, to discuss subjects submitted to it, and to tender its advice on educational questions. This council includes certain *ex officio* members and a considerable number of representatives of the different faculties of the imperial universities and of the different classes of " directors " or headmasters. These are selected by the minister of state from among candidates for the council, elected and recommended by the bodies of officials they represent—two directors, for instance, of normal schools, one director of public higher girls' schools, four directors of private schools, and so on. There is also a central board, under the minister of state for education, which licenses teachers, after testing their literary attainments, moral conduct and physique. This therefore gives a large amount of central control to the department of education.

For the purposes of local administration the whole country, except Formosa, is divided into the " Hokkaido " (the northern island), and forty-six " fu " and " ken " (prefectures or large counties). In each

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of these divisions education is entirely under the control of the governors, assisted by secretaries, councillors, and a staff of inspectors and clerks. In cities, towns and villages, all educational matters are under the management of mayors or headmen, with local councils under them and school committees responsible for the attendance of scholars.

The population of 45,000,000 seems to be amply provided for in its number of schools. There are 18,871 ordinary elementary schools, 1639 higher elementary schools, and 256 middle schools; 57 normal and 3 higher normal schools; 630 supplementary schools for technical instruction; 229 industrial and apprentices' schools; 50 special schools; 9 blind and deaf schools; 8 government teachers' training institutes; and 2 imperial universities. The ten years following the Chino-Japanese War in '94 showed an increase of 3000 elementary schools alone, in which nearly 2,000,000 more children were being educated, the present number attending elementary schools being over 5,000,000. Before the Chino-Japanese War the expenditure in the central department was £140,000, it is now £500,000; the expenditure of the prefectures was then £1,700,000, it is now £5,000,000.

In a country so alive to modern developments it is not surprising to find most elaborate regulations for the preservation of the children's health. In designing a school, 36 square feet have to be allowed for each child in the primary, and 54 in the higher elementary schools. There are not many village schools in the United Kingdom where so good a pro-

vision is made. In the same way, the sizes of the classrooms must be ample, 9 feet in height, and 9 square feet for each child. Strict regulations are laid down for lighting, ventilation and heating. Every room must have two entrances, and, if the schoolhouse consists of more than one storey—an exception only allowed under special circumstances—it must have at least two staircases. The drains are to be properly laid out—a considerable advance in Japan—and good drinking water provided. The height, width and length of desks, which are always dual; the height, width and length of seats; the height of the cross-pieces at the back, for both boys and girls, are definitely laid down in five sizes. It is, I fear, only a small proportion of education authorities in England who as yet understand the importance of proper provision in this respect, in order to prevent injury to sight, bowing of the spine and considerable detriment to education from uncomfortable attitudes.

Ten years ago the importance of school hygiene in Japan was not properly recognised; it is now fully realised and arranged for. Article I. of the imperial ordinance relating to elementary schools provides that special attention be paid to the physical training of children. Military drill and gymnastics on the German model are specially prescribed, as well as suitable apparel to be worn, and appropriate military songs to be sung at the same time. In 1897 another instruction was issued, prescribing, in detail, routine and periodical cleaning of schools, and cleaning after floods.

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In 1898, ten years ahead of the United Kingdom, a departmental ordinance was issued instituting school physicians in public schools, with definite duties laid down. Every school, except those in villages and towns of less than 5000 population, was to have its school physician, appointed by the local governor. Each of these officials was to visit his school at least once every month, and at the beginning of every term and the end of the school year, in order to inspect the sanitary arrangements of the school—ventilation and lighting, desks and seats, distance of front and back rows of desks from the blackboard, distance between stove and nearest child, temperature of classrooms, relation of school-books and blackboards to the school hygiene, disinfection of schools, quality of drinking water, and so on. In April and October he was to examine the physique of all pupils, and prepare certificates of the results for distribution to the parents. At the outbreak of epidemic diseases in or about the school he was to be responsible for closing the whole or part, or preventing the attendance of certain children. His duties as regards treatment of diseases in children were confined to emergency measures in case of their being taken ill at the time of his visits. On other measures, which he might consider necessary for the good health of the school or scholars, he was to report to the director of the school and the local governor might order him to carry them into operation. This ordinance was in 1904 being gradually put into effect, and already a third of the schools were thus provided with a school physician. The

English system, in comparison, is more complete in that every English village school is already assured of medical inspection ; it is less complete in that it provides for the inspection of every child only twice or thrice in its nine years at school. It has the advantage in that it enables the work of school health to be carried out as an integral part of the public health organisation ; the Japanese system, however, provides for the school physicians to become closely associated with the schools, whereas most English schools have to content themselves with a yearly visit from an unknown and frequently inexperienced inspector.

The Japanese child goes to school when he is six years old and stays till he is fourteen. It is interesting to note that Japan, with her open mind, after full investigation of modern systems of western education, sides with Germany, Scotland, and most other countries, in not thinking it advisable to educate her children until they are six years old. We in England, on the other hand, still retain the custom of admitting children three years earlier, and compelling their attendance one year earlier, despite the general opinion of teachers that their education is in no way hastened—indeed, in the opinion of many, it is retarded—and despite the general consent of medical men that infectious disease of a most serious nature is often thereby spread through the juvenile community, at an age when the child is least able to hold its own.

In the curriculum of elementary schools, one of the most noticeable points was the devotion of two

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hours per week for instruction in morals and patriotism ; another was the giving up of ten hours out of thirty for girls, and twenty-eight for boys, to the teaching of the Japanese language ; a third point that attracted notice was the solo-singing—for singing is seldom heard by the visitor in Japan ; a fourth lay in the three hours devoted to gymnastics. In the normal schools, in which pupils were being trained to become teachers, one of the chief ends laid down for their training was the preservation of health—for health, it was remarked, is an essential condition of activity.

Amongst other matters, the instruction given in physiology and hygiene was classed under natural history, and school hygiene was officially considered a part of school management. I fear there are too many—indeed a majority—of our English schools where the question of school health, as a concrete and definite subject of management, is never considered from year's end to year's end. It is to be hoped that instead of doing mere lip-service to regulations, as an irksome essential for the government's annual grant, we may be learning, as Japan has already learnt to good purpose, that the health of the rising generation, especially during the period of childhood, is one of the greatest assets in the future strength of the nation ; that proper care for their bodies at this age will enable them to grow up useful and healthy citizens ; that proper instruction, and above all the conscious cultivation of healthy habits, may enable them to live healthily throughout their lives ; and that, in matters of so great import-

ance, education committees must give a fair hearing to the advice of the profession which makes such matters its special study.

The special care bestowed by Japan on her human assets, in body and mind, is strikingly shown in the Japanese prisons. Our distinguished medical military attaché kindly took me one day, while he was awaiting orders to go to the front, to visit the Ichigaya prison, on the outskirts of Tokyo. This is a large institution, containing in its ample grounds many slender buildings, in the usual Japanese style, for 1300 male prisoners, undergoing sentences of from two weeks to ten years. From a warder who spoke a few sentences of English, we found certain resemblances to the Borstal system in operation. The different classes of prisoners were separated except for work, but work is the keynote of prison routine. Every prisoner is set down to do the work for which he is most fitted; and while on the one hand the spell of prison life thus inculcates the routine of useful living that may and should be pursued on leaving the prison, on the other hand £13,000 of the £80,000 which the prison costs a year are recovered by the work done. The prison is a workshop, not a "house of correction" on the melancholy lines on which we interpret the term; and the results are of the happiest nature.

In one long, airy, well-lit wooden building, ten-score decent-looking, busy men, in brown kimonos, were sitting in rows down the floor, making grass sandals, and it looked as if they did it with a will

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and of habit, not simply on the entrance of our official group, so that presumably they were paid according to the amount of work they did. In another room they were making thread ; in a third, matting ; a couple of men were engaged in carving designs in wood of considerable merit ; a roomful of boys were making umbrella handles ; while a few were cooking, and some were doing coolie work in light chains, like those depicted in certain posters about Chinese slavery in England. The men and boys all work for ten and a half hours net every day, four of which, in the case of boys, were educational. The women in the prison twenty-one miles out mostly do needlework. The system is surely excellent, and it is hardly credible that a work of such public necessity should be neglected in this country for fear of competing with the manufacturers. If this is, as I believe it to be, the ultimate reason for not adopting the system widely at home, here, surely, is protection run wild.

It is interesting to note that this system of imprisonment, in which a casual observer might be led to see the superiority of Japanese administrative ability over British, differs only in detail from that adopted very generally throughout India, where fortunately the interests of the manufacturer do not, or are not allowed to, compete with works of public utility. I may add that the Indian gaol is managed in all its departments by that maid-of-all-work, the Indian Medical Officer. In large centres officers are detailed—as, for instance, at Lahore—purely and solely for the superintendence and general manage-

ment of the gaol; in others—as, for instance, at Amritsar—it is one of the innumerable duties of the Civil Surgeon. The officer in charge of the gaol at Lahore had, of course, the care of the prisoners' health, but this was the least of his duties. It might be thought that the discipline and general management of an institution accommodating over 1000 prisoners would be a sufficient task for one man, but, in addition, he had to arrange for them to carry out work of various kinds, to purchase the raw material, to enlist warders to supervise the manufactures, to find markets for the goods, and to arrange carefully the whole accounts of the business. The carpets produced in the Indian prisons are known to be amongst the best in the world manufactured at the present day; and in the Amritsar gaol all the prisoners' clothes, blankets and mats were made on the premises. One may well have a regard for the rightful interests of manufacturers, on whom the whole wealth and stability of the British Empire primarily depend; but without injury to them it is now becoming recognised as both possible and advisable to develop those systems by which our prisoners in the United Kingdom may be encouraged and helped on towards a better and more useful life than that which has landed them in gaol. It is a complement indeed to the system of national education. However well the young generation might be educated, however well they may in future be trained in morals and patriotism, a certain proportion will always slide back in after years into crime or misdemeanour. As by education

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we try to give them a good start in life, so, by an intelligent use of our prisons, we should give them a practical incentive to return to that way of life which is as much to their own happiness as it is to the good of the community.

To turn now to public health, of the acute infectious diseases Japan in 1908 suffered most from enteric fever, which caused nearly 6000 deaths in 26,000 cases. Dysentery, most prevalent from July to September, gave rise to nearly 25,000 notified cases and 6000 deaths; and smallpox also caused nearly 6000 deaths out of 18,000 cases. The fourth most serious infectious disease was diphtheria, mostly between November and February, also giving rise to nearly 18,000 cases, of which nearly 5000 were fatal. Cholera caused roughly 650 cases and 400 deaths; scarlet fever, 900 cases and 130 deaths—a very high mortality of 15 per cent.—plague, 350 cases with 280 deaths; typhus, 3 cases with 1 death. Leprosy caused 8000 deaths and malaria nearly 800.

With regard to mental diseases, nearly 5000 persons were in confinement at the end of the year, apart from 100 in temporary confinement and nearly 22,000 insane persons registered but not confined in hospital. Of those confined in hospital 41 per cent. recovered, 27 per cent. died; while of the others 16 per cent. recovered, 15 per cent. died.

Of venereal disease there were over 74,000 cases, 47,000 prostitutes being submitted to inspection every week, about 3 per cent. being found infected. There were 564 “brothel-quarters” and 309 hospitals for these women.

Of all the causes of death tubercle is by far the most frequent, showing the terrible hold that disease has on Japan, owing probably in no small degree to housing conditions. Of under 1,000,000 deaths, over 75,000 occurred from tubercle of the lung, 14,000 of the intestine, 5000 of the brain, and it is noticeable that over 63,000 others died from meningitis.

The work of midwives is under control ; 1166 were newly registered in 1908, 1155 having passed the required examination ; while a further 282 were licensed to practise within a limited district. Of the 26,000 registered, 7000 had passed the examination, 10 names were removed, and 600 died during the year.

As to sanitation, the Japanese are taking up each problem in turn, one at a time. Water-supply, the most important in Japan, was already by the end of 1908 settled on a large scale for seven of the chief and two or three of the smaller cities and was sanctioned for thirty localities in all. An interesting table in the annual report for 1907-1908 of the central sanitary bureau, department of home affairs, gives the proportion of population in each town and in each prefecture served by various sources of water-supply. In Tokyo 60 per cent. of the 2,170,000 inhabitants are supplied from improved waterworks, 35 per cent. from ordinary wells, 5 per cent. from artesian wells. In Osaka, with a population of 1,218,000, 96 per cent. are supplied from improved waterworks. The whole country has a population of 49,000,000 ; 3 per cent. only were supplied by improved waterworks,

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5 by artesian wells, 68 by ordinary wells, 12 by river, 11 by springs, and the rest by ponds, rain water or old-style aqueducts. The need of improvements in the water-supply is shown by the occurrence of some 25,000 cases of typhoid fever in the year, with over 5000 deaths.

Water-supply is costly but remunerative ; sewerage is costly but unremunerative. It is not surprising to find sewerage schemes during 1907-1908 only sanctioned for the four towns of Kobe, Hiroshima, Nagoya and Sendai ; and the number of water-closets only amounting to 3000. Scavenging is more systematically done, some 3000 scavengers being employed.

Slaughter-houses numbered nearly 1000, 52 being public and the rest private. Twenty-one prefectures, including Tokyo and Kyoto, out of the 27 had no public slaughter-house ; but there were 8 inspectors with 521 assistants engaged in this department alone.

Milk is drunk to the extent of 8,000,000 gallons in the year, giving an average of  $1\frac{1}{2}$  pints a head ; and in 1908 there were nearly 5000 dairies under supervision. Samples were taken and tested and fines inflicted not infrequently with regard to various other articles of food and drink, 15 per cent. of those of ice and snow and over 20 per cent. of refreshing drinks being contaminated.

Vaccination, owing to the prevalence of smallpox, is welcomed by the people, the number recorded during the year of 1908 being 9,398,135 or over 18 per cent. of the population, about one-fifth of these being primary vaccinations.

Latterly in Tokyo they have been demolishing insanitary areas and widening streets, and soon they will turn their hands to sewerage. Indeed, they would probably have already undertaken this large problem, had it not been for the heavy financial demands of the Russo-Japanese War, which required all their attention. This sewerage is badly needed, for the sake of all the stagnant pools and irregular ditches, in which the mosquito breeds furiously. Fortunately this mosquito is mostly the *culex*, not the *anopheles*. The *culex* annoys but it does not carry the malarial parasite, and so in Japan they have little malaria.

Indeed in Japan, where agriculture is a fine art, where every scrap of useful refuse is economically preserved on the Chinese plan and distributed over the fields, house drainage is not so important as at home. Her system of sewage disposal, like most of her customs, Japan has derived from China, or from a common source. In China it is recognised, as has recently been worked out in England, that for agricultural purposes every adult individual is worth 17s. 6d. a year, and sanitary visits are requested from the passers-by at every turn of a frequented road. The contractor for removal of filth from the municipality of Shanghai actually pays £8000 a year for the privilege. In our walk across the peninsula from Nagasaki, we, with our European noses, could not fail to be aware of the Japanese system of sewage disposal, even if we had failed to understand the meaning of the coolies passing along the road from the town, with covered



Sewage-Disposal on the Rice-Fields of Japan,



wooden buckets, hanging from either end of a pole, over their shoulders. As a result, the ricefields, in which the peasant works above his ankles in mud all day, are really elaborate sewage farms on a large scale, and managed by instinct on the most scientific principles. There is no evidence that, in a sufficiently moist country, any damage is done to the public health by this system (Plate 12).

But it is strange to find that a people so delicately refined throughout all classes in their appreciation of form and colour and design should be so indifferent to scent. This indifference is shown in the small attention paid to scent in the flowers they cultivate so ardently. It would be of interest to know whether it comes from habit or from birth. We in England should be inclined to say that their lack of smell is as dangerous as sitting on the safety valve of a steam boiler, for we associate the practical use of our nose with leaking drains, and leaking drains with disease. Perhaps we are wrong, or at anyrate should be wrong if it were not for our water-carriage system of sewage disposal. In Japan at anyrate no one seems to mind the common smell of fresh sewage.

This revives the question whether the late Vivian Poore's system of rural sanitation can be used without danger to the community for small towns, as he showed it could safely be used in his own garden, when properly superintended by himself. If preserved for three weeks, it is found that pathogenic germs disappear, and it is therefore only a question of difficulties of distribution and disadvantages of

smell. Air-tight bins for removal would be a certain improvement on the Japanese wooden tubs, and their open earthenware receptacles fixed into the ground below closet seats, from which the coolie has to rake out the nightsoil with much fouling of the surroundings, have nothing to recommend them. These are difficulties that could be remedied ; the smell could never be.

But it is one thing to devise an ideal system, another to carry it out throughout a large community ; and experience in many English villages shows it to be certain that, in any large community comprising the less educated classes of our nation, many householders would be entirely indifferent to details of the system which are inseparable from the public safety. The sewage would in many cases be allowed to accumulate in heaps, causing a standing nuisance and a great danger of pollution by flies and dust—if not, as for instance on a chalky soil, of pollution of the water-supply. Public scavenging and official supervision of night-soil distribution are the answer, but it is doubtful if the Britisher would ever allow the entrance to his castle and the interference with his household affairs which such public supervision, to be thorough, would necessarily entail.

In Japan, however, the present system works well throughout the country. Even in the large towns it does not result in more than a nuisance ; the sewerage of Tokyo therefore is not of the first importance, and everything in this direction was in 1904, and probably is still, at a standstill for lack of

funds. It will be interesting as well as instructive to learn the results of their scientific experience and careful observation on the vital statistics of Tokyo and other chief towns in ten years' time. If they are able to show us that large aggregations of mankind can safely dispense with the water-carriage system which entails for us so much expense and trouble, we who have at heart the reform of the public health without undue cost to the community shall be among the first to welcome their new experience. But the chances are infinite to the contrary ; water-carriage in a compact, busy community is by far the best system all round.

This brief outline of sanitary and educational administration shows the astonishing power of Japan to study foreign systems and to apply them, as they may require and as conditions may serve, to her own use. The progress made in these matters in the last twenty years suggests the progress the Japanese nation is likely to make at least in every material department of the national life, under the stress of international competition, under the stimulus of her remarkable energies and national spirit, during the century now under weigh.

## CHAPTER X

### THE EVACUATION OF NIU-CHWANG

*(Reprinted by kind permission from "The Times")*

IT was a glorious summer afternoon as we sat looking eastward from the first-floor verandah of the Australian stationmaster's house at Yin-kau in North China, across the broad river to Niu-chwang in Manchuria, in the first few months of the Russo-Japanese War, on Friday, 22nd July 1904.

On our left between us and the River Liao ran the trunk line of the Imperial Chinese Railway, which had just brought me up in thirty-one hours from Tientsin, the military menagerie of the eight nations and China, all—Russians and Japanese included—still flying their respective flags and saluting each other's officers in a friendly way in the streets; up through Shan-hai-kwan, where the 80th Punjab Infantry maintained the traditions of British soldiers for hospitality, and where Sikhs were seen flag-wagging on the Great Wall of China as the train steamed through a breach in its fifteen feet of rough masonry. In front of us was the terminus station of Yin-kau, a small settlement, mostly of railway employees, on the right bank of the Liao River; on the station platform were a score of Chinese troops, uniformed in dark blue rags and old straw hats, armed with Schneiders, Lee-Metfords and what not, filing off

after their parade to receive the evening train. Beyond the station and over the river, fifteen miles to the east, lay the blue-grey hills, veiled in mist, in which lay the junction of Ta-shih-chiao, where the main Siberian line to Port Arthur was joined by the branch Russian line from Russia-town, Niu-chwang. Russia-town, with its solid railway station and hotel and two or three dozen small houses, water distillery, stores and coalsheds of galvanised iron, lay three miles to the north-east, half left from where we sat, on the farther bank of the Liao, which wound down a devious course of twelve miles from the ridge to our left, to its mouth, past our right, and out into the sea to the right behind us. Away in the distance on the other side, twenty miles to the south-east, we could just make out the great hill of Kaiphing or Kai-chan, now for some days past in Japanese hands. The river close to our right was studded with junks and sampans, paddling upstream with their strong oars or running down with the tide. The Russian official launch, which had kindly put across to take a Chinese railwayman, injured by a falling sleeper, over to the hospital, was busily threading its way upstream. On the other side was the fort, and up the farther bank there spread in the endless distance, fringed along the water's edge by a forest of junk masts, the dusty tops of modern Niu-chwang.

On our side was the blind end of the Chinese railway, neutral ground and peace ; on the other the Russian railway terminus, Russian usurpation and war. For many days past the sound of distant firing had been heard south of Ta-shih-chiao, and Chinese

had reported fighting, in quality and result as vigorous as imagination could conceive. No Russian sick or wounded had at any time been brought into the town ; no one knew the strength of the garrison, and, apart from the soldiers on guard and at work about the town, it was only known that a few days previously 1500 men had marched in again after the short absence of an equal number in the neighbourhood. Reports of evacuation had all been false, the frequent movement of troops out and back being due either to a desire to impress the Chinese with a false idea of Russian strength, the exit generally taking place by night and the return by day, or else to a systematic method of maintaining efficiency in the garrison. No foreign battleships were in the harbour. Only the Russian gunboat, the *Svetch*, was inside. Sunset fell in perfect rest on a prospect as rich and peaceful as that on which it might have fallen eight hours after on the wold of Sussex or the Yorkshire moors.

A British official of the Russian municipality took me in charge. The river was crossed in a sampan after a hard pull, or rather a shove with the stern oar, against a five-knot current, in and out through the junks moored three abreast along the bank, up to the Customs' quay. A sentry challenged the approach of our craft—out against rules after dark. Hardly anyone was to be seen ; the hotel was full, mostly with Russian officers, whom we saw playing billiards through the open window ; and finally my companion, with the kindness characteristic of an exiled Briton, carried me off to his own house.

On Saturday, the 23rd, we awoke to the distant sound of guns, which had been firing continuously, so said the Sikh watchman, since four o'clock. Climbing up two flights of stairs and a ladder, we perched ourselves on bags of grain across the ridge of the roof and looked out for signs of the fight. Every now and again a small patch of smoke against the dark green of the nearest hills enabled the site to be determined as from ten to fifteen miles to the south of the railway junction at Ta-shih-chiao ; but little could be seen all day, and the firing continued with intervals of only half-an-hour or so until seven o'clock. There had been a big battle, it was reported, with 3000 casualties on the two sides, and the Japanese were still eight or ten miles from the junction, so that Russian communication with Liao-yang and Mukden was still intact. Would their enemy rest another fortnight, as usual, before facing another action, or would they press on at once and take Ta-shih-chiao ? The question was much debated ; for 40 or 50 Russian cavalry appeared in town, and it was said, it appears with truth, that they belonged to the main army, from which they had been cut off by the Japanese. On the other hand, the Russian officials showed no signs of impending danger, and there were no obvious preparations for withdrawal. The Russian Administrator, to whom I applied for leave to visit the hospitals at Liao-yang and the front, gave some hope of such leave being granted, although it was useless, he said, to telegraph for permission until the present battle was over. He was asked permission the next morning.

But on Sunday morning the firing began again at five o'clock with increased severity. Every roof was crowded, and on the roof of the still incomplete Administration Building we were a fine motley of European nationalities, mixing with the Russian officers in uniform and the better-class Chinese.

The shell-fire was now to a large extent on our side of the hills ; every other shot heard was represented by a puff or puffs of smoke, and as all but horse batteries in the Russian artillery had eight guns, and the Japanese had six, and as the batteries or half batteries often fired volleys, it was possible to distinguish to some extent between the two armies.

During the morning the artillery duel advanced a little towards Ta-shih-chiao, but in the afternoon it reappeared ten or twelve miles away, while towards evening soldiers were seen pressing right over the hills behind—that is, on the east side of the railway junction. We hear now that the whole of this artillery duel was a feint rather than an attack on the part of the Japanese to retain the greater part of the Russian forces, while most of General Oku's army from the south pressed round to the east to join in the attack on Liau-yang and cut off the Russian retreat. That a considerable battle was taking place around Liau-yang, with General Kuropatkin himself in command, was not concealed by the Russian officials in Niu-chwang ; but still there was no sign of their leaving the town. For an hour or more the doctor attached to the administration, a lieutenant-colonel in their medical service, was telling me about their hospital arrangements over a cup of tea, and

talking in French or fluent English, rather than in Russian, with Prince Jaimé de Bourbon, Don Carlos' son, who for eight years had served in a Russian cavalry regiment, and was now in the town awaiting orders. Firing never stopped all day except for a few minutes. Morning service in the graceful little English church, with doors open, was conducted to the accompaniment of gun-fire, a few Russian soldiers coming in, in khaki, and sitting on the steps of the font, at the west end. As the sun fell the flash of bursting shells became obvious rather than the smoke—the position appeared unchanged; Ta-shih-chiao had evidently not fallen—and by nine o'clock all was still again.

The next morning, Monday, 25th July, we were roused at six o'clock by the news that the Russians were gone. Many, indeed, were gone, and the last train had left Russia-town at five, with what fate I never heard. We mounted again to the housetops, and between seven and nine there passed out along the road at our feet the remaining Russian infantry and details, a stalwart-looking set, fine marchers, but thickly clad—the same for winter and summer, they say—with a heavy coat, rolled over one shoulder and under the other, and many pounds of kit hung about them. The temperature these days had been 98° in the shade, and the air was always moist. Away up the river, headed by the *Svetch*, steamed the seven Russian launches; and Niu-chwang was evacuated. The civil officials remained, but the flag hoisted at eight o'clock over the Administrator's house was no longer the national but the commercial flag.

The Russian Administrator was now only one out of many consuls. Finally at eight-thirty A.M. there arose over Russia-town, three miles off, a dozen points of flame and a dozen pillars of dense white smoke, which gradually merged themselves into one vast cloud, blotting out a third of the landscape, right up into the clouds. The lesson of 1812 still lives.

It is difficult for those at home to realise the anxiety of the situation that now presented itself to the residents. The Russians had completely evacuated the town, offices, barracks and fort. The Japanese were still far off and might not come for a couple of days. Here in Niu-chwang was a population of 7000 Chinese or more, containing, it was known, a large number of former Boxers and Chunchuses, the brigand guild of North China; large bodies of Chunchuses were known to infest the surrounding neighbourhood, and would certainly have seen the smoke of Russia-town and have read the meaning of the sign. Chinese official authority had long been crushed out of existence. The 500 native so-called police would be little able, if willing, to stop any serious mischief. There was not a gunboat nearer than Ching-wang-tao, eighty miles off down the Gulf of Pechili, whither H.M.S. *Espiègle* had retreated two or three months before, when not allowed by the Russians to stay at Niu-chwang. The local volunteers, useful enough during the Boxer outbreak, had long ceased to exist. It was necessary, therefore, for the consular body and the leading residents to combine in improvising measures for the defence of the European settlement in case



AN EPISODE IN THE RUSSO-JAPANESE WAR.



(a) The First Japanese Scouts into Ninchwang.

(b) Russian Forage Smouldering and Chinese Junks waiting for Loot.

of trouble, leaving the police and the Chinese merchants' guild to look after the Chinese town; and meanwhile to despatch messengers on foot, horse-back and bicycle to inform the Japanese of the evacuation and to ask some officer of sufficient authority to occupy the town as soon as possible. On Mr. Millar, the American Consul, who had recently presided over the court which sat in the case of the murder of Mr. Louis Etzell, fell the responsibility, as senior consul, of initiating proceedings. Mr. Little, the British Consul, telegraphed to the British Minister at Peking; but the *Espiègle* at Ching-wang-tao would take six or eight hours to arrive, even after receiving sailing orders and getting up steam, and on arrival might not be able to cross the bar on the ebb-tide. One gentleman was appointed head of a volunteer police force; but most men had wives or property of their own to protect, and would not be able to leave their houses unguarded at night. Messengers were sent out both by private residents and the consular body, the heads of the chief shipping firms, with good local knowledge at their hand, being of chief assistance in arranging these and other measures. Meanwhile the looting was proceeding apace in Russia-town. Half the sampans in port had spread their sails and sailed up the river; and after two o'clock four of us followed them to find out what was doing. The sight was a memorable one. Along the water's edge were moored the junks and sampans, rapidly being filled with coal and wood. In the water there floated odds and ends of timber, a wardrobe, a dining-room table, with its

new owner seated on it or wading or swimming behind. On the banks of the river smouldered the burning stacks of forage (Plate 13). In front of the distillery and sheds there hacked and hewed away at the coalsheds, as they had never worked for wages, a number of naked or half-naked Chinese coolies, filling their baskets and carrying them on poles to be piled into the boats. Galvanised iron was being stripped off the roofs of houses ; floors ripped up ; doors and windows, and even window-frames, wrenched away ; and no vestige of authority existed to represent the law of property or the power of the European. The houses and station buildings were mere shells, untouched by fire, but swept of all else ; and the only mementoes we brought away with us were a torn playing card from the hotel, a bit of wall-paper and an old telegram from the station. The wooden church still stood, with its four small Greek crosses on the roof ; but for all else it might well have been a derelict barn, and the site of the altar was marked only by a great gap in the wooden floor, where the barbarians had evidently looked for treasure. Here indeed was the Yellow Peril, man naked and unashamed, the savage free to make havoc and seize his booty, untrammelled by any law or responsibility. But here, on the other hand, was the retribution of wrongdoing in nations pictured most vividly in a single scene. The massacre of 7000 Chinese in the Amur at Blagovestchensk at the outset of the Boxer trouble had met its reward.

By four o'clock we were back to welcome the first

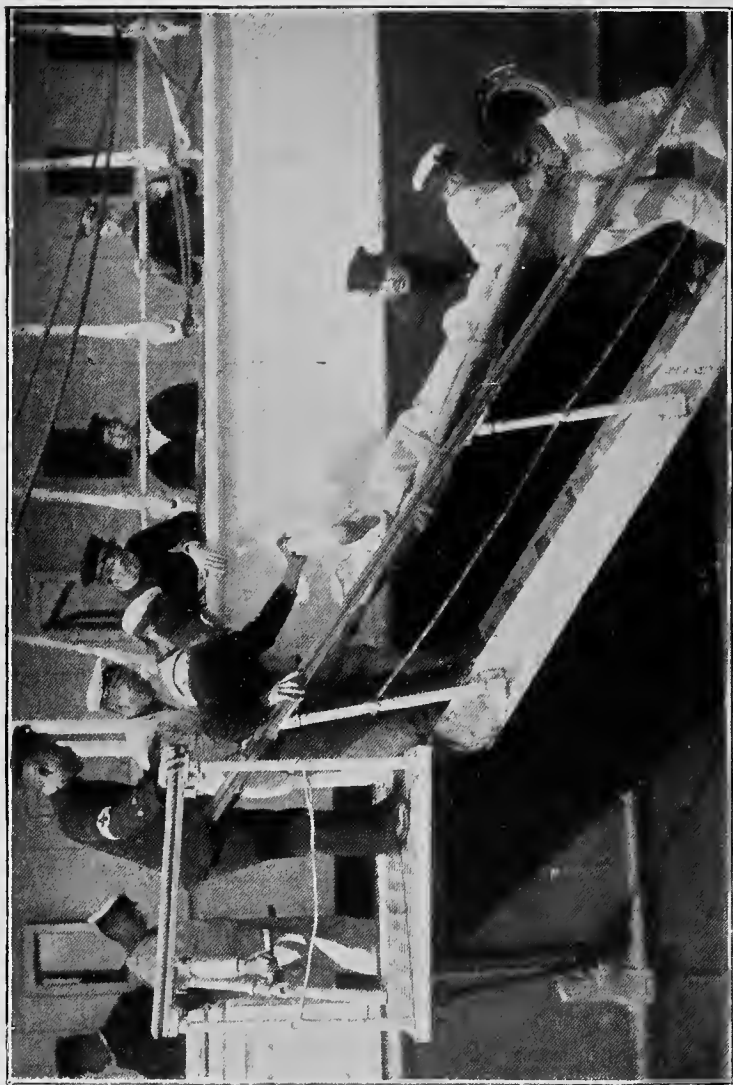
five Japanese scouts on their sturdy, shapely, healthy ponies, about 14 hands high, none the worse for the heavy weights they had to carry (Plate 13). The men themselves, dressed in khaki, with blankets, peaked caps and yellow puggarees, breeches and light-built riding boots, armed with sword and carbine (one we noticed blood-stained) could have stood only 5 feet 6 inches or so high; but with saddle-bags, forage-bags, coats, well-filled haversacks, they must have ridden 14 or 15 stone. The first had been met, finding his way without the least difficulty with a complete map of the neighbourhood, although totally ignorant of Chinese. Making their way straight to the Administrator's house, they were surprised to see the Russian flag lowered and the French flag hoisted before their eyes, and on halting in front of the gates they received the welcome of the Chinese Guild; while the guards set to work to free the recent Russian military headquarters—an old Chinese temple—of their remaining contents.

By nine o'clock 50 Japanese cavalry had already halted by the house of one of the chief residents, who had played a leading part in the day's proceedings, while his wife was fortunately able, with a fluent knowledge of Japanese, to act as interpreter.

Mr. Victor Grosse, the able Administrator, who for the last two years had won the respect and esteem of all residents, independent of nationality, remained, although in mufti, under the protection of the French flag, and refused to meet the Japanese officers. The personal sympathy felt for him in the circumstances was as universal as were the relief at the appearance

of the Japanese, the general admiration at the success of their troops and the preference for their public policy. A few other officials remained ; but almost all the Russian civilian population, including the staff and treasurer of the Russo-Chinese Bank, had moved across to neutral territory on the other side of the water, where in the station rest-house they awaited the next train for Taku and Tien-tsin. Many unfortunate Russian and other white women, urged by terrible details told them by the Russian troops before leaving, as to the maltreatment and mutilation of their kind by the Japanese—absolute falsehoods, we may well believe—had in the early hours of Monday morning, in varying degrees of déshabille, already crossed the river. For fear of the Chun-chuses hardly a native was visible out of doors ; and it was with difficulty that a sampan was found on the left bank of the river to take me out to the steamer which carried myself and this letter with break of day and turn of tide down to Chifu.





Discharging Wounded from the Hospital Ship "Kobe Maru" at Sasebo.

(Male nurses in white; officers and crew in blue; Red Cross brassards. Dr. H. Sonobe, I.J.N., ranking as naval lieutenant, looks over the taffrail to superintend. Bearer at foot of stretcher is cleverly reinforced.)

## CHAPTER XI

### A VISIT TO SASEBO—THE NAVAL HOSPITAL OF JAPAN

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SASEBO is the chief naval base of Japan, possessed of a large, deep and completely land-locked harbour and closely surrounded by fortified hills. The mouth of the harbour opens deviously and picturesquely on the west coast of Kiushiu, the first large island of Japan that a ship touches in coming up from Shanghai or across from Chifu, Tien-tsin or Port Arthur.

It was therefore only two days' journey at most for the sick and wounded of Admiral Togo's fleet to be comfortably transported in the *Kobe Maru* or the *Saikio Maru*—the hospital ships belonging to the Japanese navy—to the ample comfort and professional skill of Surgeon-General Totsuka and his base hospital at Sasebo (Plate 14). The traveller, however, reached it only by a five hours' journey northward from Nagasaki or seven hours' down from Moji in the Straits of Shimoneseki; and then he was admitted only as an exceptional favour with a permit from the Minister of Marine at Tokyo. Sasebo, moreover, was under martial law and every foreigner on the railway was closely cross-examined by the police. Few foreign visitors had visited the town, but amongst them must be reckoned the crews

of a good many British colliers, twelve of which were in harbour in August, 1904, on the day of the visit described in this chapter. The other chief naval stations and the only other naval hospital of importance were in the Inland Sea—a hospital with thirty beds at Kure, where the first two ironclads built in Japan had recently been laid down—a large naval station, situated an hour by boat or rail south of Hiroshima. Hiroshima, on the other hand, three days' journey by sea from Port Arthur, was the chief military medical base, with hospitals for 4000 sick and wounded, from which the slighter cases and the convalescent were drafted on to Tokyo or Osaka, while the Russian prisoners were taken straight to the equally admirable hospital and prison quarters at Matsuyama in the island of Shikoku, which closes in the Inland Sea from the south.

*The Unique Features of Modern Naval Surgery.*—The essential feature of the work at Sasebo naval hospital was that 90 per cent. of the cases of ordnance-wound were inflicted by shell and not by bullet. Here then, for the first time in history, the science of shell-wounds was being studied under good modern conditions. For in South Africa hardly 5 per cent. of wounds, even early in the war, were inflicted by shell, and these were scattered up and down the country through a dozen different hospitals, so that a concrete study of their peculiar features was impossible. In the Spanish-American and Chinese wars there were few casualties from artillery; and earlier wars furnished as little experience for the use

of the modern surgeon as for that of the modern artilleryman. During the first six months of the Russo-Japanese War 180 cases of naval shell-wound had survived to reach Japan. The report therefore of the medical department of the Japanese navy at the conclusion of the war will have made in this respect a definite addition to surgical science. The three surgeons-general of the navy know English well, and will, it is to be hoped, issue a report in our language on the precedent of their valuable report after the war with China in 1894. The Director-General, Baron Saneyoshi, was educated at St. Thomas's Hospital, and is a Fellow of the Royal College of Surgeons of England. In both of these spheres he is on common ground both with Surgeon-General Totsuka and with one of his predecessors, Dr. (now Baron) Takaki, who at the age of twenty-five became Director-General of the Medical Department of the navy, improved the rice-diet and stamped out the scourge of beri-beri from the ships in introducing a thorough system of sanitation.

The director-general ranks as a vice-admiral with two small stars on a broad gold stripe down the shoulder-strap. The other two naval surgeons-general rank as rear-admirals, with one star on a small stripe of gold ; and medical officers of lower degree are called doctor, rank with captains, commanders and lieutenants according to seniority, and wear the corresponding marks of rank.

The difference between explosive shell-wounds and bullet-wounds is absolute. The effect of the bullet depends upon what important structure it may

strike—bone, nerve, artery or internal organ. If it pass through flesh only and strike no such structure, and if the wound be kept clean from the first, the patient is perfectly recovered in a few days, the wound healing by primary intention. The effect of the explosive shell, on the other hand, is a laceration. The wounds of those who survived to reach Sasebo were either surface wounds or mutilations of a whole limb. The treatment is usually that of any other surface injury or else amputation. Shrapnel-wounds take an intermediate position. They are caused by half-inch leaden balls, scattered in large numbers in various directions on the bursting of the metal case ; and owing partly to their comparatively small momentum, partly to their rough, leaden surface, partly to their having no screwlike rotary motion which gives to the rifle bullet its great penetrating power, and owing partly also to the particles of sulphur in which they are embedded in the case, they frequently remain in the body of the patient they hit and introduce sufficient contamination to set up suppuration, abscess and occasionally blood-poisoning. Put tersely, then, the bullet-wound is a shot through a roomful of machinery ; the shell-wound is an explosion in or near the machine-house ; the shrapnel is a lucifer match thrown in through the window.

Cases of gunshot or shrapnel wound in the navy of to-day must almost invariably indicate fighting on land, and these cases at Sasebo were incurred by men landed from the ships to assist in the fighting round Port Arthur. It is seldom now that men-of-war

approach each other near enough to make it worth their while to fire shrapnel. For the object of shrapnel is to kill or wound men, not to injure ships, and the aim in modern fighting on sea is essentially to sink or damage ships. In Nelson's days naval battles were necessarily at close quarters, and it was an attainable object to sweep the decks and to tear the sails and riggings with musket and grape shot and with cannon ball so as to deprive the ships of all control. But now, with torpedoes and long-range rifled guns, with machinery instead of sails, and the whole protected 'neath decks below the water-line, or in armour-plated bulwarks, conning-towers or barbettes, the only methods of disabling a ship are to ram, torpedo or to breach the steel protection and damage the contents with heavy shell. Wounds on board ship, therefore, are usually the result of ragged splinters and sections of shell. But torpedo craft, with plating only  $\frac{3}{16}$ -inch thick, offer little protection to their crews and may occasionally be subject to raking shrapnel fire.

*A Few of the Cases.*—The only case of shrapnel-wound that detained us at Sasebo was that of a man hit a fortnight previously in the fighting round Port Arthur, in which the shrapnel-shot passed in behind the shoulder and lay buried there. It was extracted and the patient was in a fair way to recovery. Another shrapnel-shot had passed through the flesh in front of his elbow without touching bone, nerves or artery, and had made its exit without causing any serious damage. There was not a single case in the

hospital of a penetrating wound of the abdomen. Head wounds were limited to wounds of the scalp or fracture of the face-bones. There was one case in which a depressed fracture of the skull had been successfully treated by operation. During the first six months of the war there had been two cases of chest wound in which bullet or shrapnel had remained in the chest and were extracted, two or three in which they had passed out again. The other cases noted were all of limb wounds. G. Ishii of torpedo boat No. 67 had been severely wounded by shell in the month of May. A photograph showed clearly what his original condition had been, with the humerus broken, nerve severed, causing paralysis of the hand and a gaping wound a foot long on the outer side and back of the arm. Amputation had been necessary, and now, early in August, the man was sitting up comfortably in bed with the wound healed, waiting for his artificial limb. One other case of a stump after amputation was pointed out. The leg had been well amputated through the knee-joint, and the artificial limb, light and well-made, with good thigh piece, waistbelt, knee, ankle and foot joints complete, had just been tried on for the first or second time. These limbs are presented by the Empress, and are made of course in Japan, whose carpenters, joiners and cabinetmakers are perfect craftsmen, especially in bamboo.

But very few cases had been serious enough to need amputation, from which fact two inferences may be made: firstly, that few hopeless lacerations of the limb survive; and secondly, that conservative

surgery is now an attainable ideal in almost all cases that reach hospital. The myth that surgery on the battlefield consists of amputations and ligature of arteries is fully exploded.

*The Rarity of Death.*—Five fatal cases had occurred in the hospital during the first six months of the war. Deaths, it is commonly understood, are now of rare occurrence on the surgical side of a military or naval hospital, a change due to Lister's and Pasteur's work. And the further removed a base hospital is from the scene of operations the more complete should be the sifting out of serious cases before the remainder are sent down the line or across the sea to the base. But this applies less to sea than to land; for the wounded at sea find the analogue of a field-hospital in their hospital-ship, which might just as well convey them to the base as remain with them in the neighbourhood of naval operations. Indeed, hospital-ships and hospital-trains might well be equipped and scheduled as mobile field-hospitals; and the twenty luxurious hospital-trains on the Russian side in Manchuria were so equipped, with operating-rooms, baths, kitchens and quarters for a full staff as well as for no less, on the Czarina's magnificent train, than 200 lying-down and 200 slighter cases, as compared with the 100 odd that were taken by each of our five hospital-trains in South Africa. Thus one of the patients who died at Sasebo, M. Ono of the *Fuji*, was able to be transported by ship although suffering from a shell-wound to both legs, resulting in double gangrene and death. If anything could have saved

him it could have been done in transit in the operating theatre of the *Saikio Maru*.

*Shell-burns.*—Shell-wounds, then, are mostly lacerations of the soft tissues. But there is another effect which comes into increasing significance with modern artillery. When a shell bursts, all men within a radius of several yards are in severe danger of burns from the explosion. When watching the two days' artillery duel at Ta-shih-chiao near Niu-chwang on 23rd and 24th July, every explosion towards dusk seemed to us, fifteen miles away, as a flash of light half as high as the hills on which it exploded, and as broad as it was long. Although the duration of this light cannot have been one-fifth of a second, yet its brilliancy and extent suggest the injury it may inflict. At Sasebo they had a large number of cases in which burns had complicated wounds or had constituted the sole injury. These burns were clean, at least to the naked eye, and not of great depth; they were treated like ordinary burns and redressed with aseptic gauze every other day. They had healed well, and so far there had been no case of complication or after-effect. The scar was simply lighter in colour than the surrounding skin.

*The Red Cross Society at Work.*—One man who had suffered from clean-cut wounds, now healed, behind the elbow and shoulder, had probably been struck by shrapnel. He belonged to the *Shikishima* and was one of the many hundreds who volunteered and of the few who were selected to take the six tramp-

steamers into the mouth of Port Arthur and to sink them there in a perfect typhoon of artillery from ships inside and forts above. He survived, however, to be nursed by Mrs. Totsuka, wife of the Surgeon-General. This lady wore the serviceable white uniform of all who nurse under the Japanese Red Cross. The female nurses employed in the military and naval base-hospitals and ships—for none served in Manchuria—were all engaged and paid by the Red Cross Society of Japan. Many Japanese ladies were also in this war for the first time admitted to help in the work, although their trained assistance was soon restricted to the rolling of bandages and the preparation of first field-dressings, little packets that are sewn into the tunics of every soldier when he goes on active service. The social importance of this development can hardly be appreciated in England. Nursing in Japan has long been a tradition of Japanese women, but of women only of the lower classes. Considering that the feudal system was abolished only forty years ago, it is not surprising to find that hitherto there has been little mixing of the classes. For ten years, however, the Ladies' Volunteer Nursing Association, working under the control of the Red Cross Society, had been busily engaged in raising the credit of the nursing profession. Every day of the week during the war the ladies of Tokyo worked at the Red Cross Hospital, Europeans one day, Japanese five days a week; and it was an interesting sight on a fine July afternoon to see fifty of them of all ranks—from the Princess Nashimoto and Baroness Nobeshima, her

mother, downwards—in their white cotton uniforms and caps busily engaged in rolling bandages. Twenty thousand of these bandages had recently been sent out on the *Hitachi Maru* and sunk by the Vladivostok squadron ; but the ladies with characteristic courage set to work, now at seven o'clock each morning, to roll 20,000 more bandages—a somewhat typical incident in this war.

It was interesting again on another day to attend a meeting of Japanese ladies at the Red Cross dépôt on the 1st July, where upper and middle classes met to be instructed in bandaging the dummy by a retired, white-bearded army doctor. A roof and a raised floor ; a crowd of Japanese ladies in their sober mauve or grey kimonos standing round the easel, blackboard and dummy ; the quiet, conventional garden outside ; the alcove in which three of the princesses sipped tea afterwards with a lady-in-waiting and shook hands with the foreign visitor ; the court ladies talking freely with all comers when the demonstration was over ; the delicate models on a side table of every kind of improvised stretcher and apparatus for carrying the sick and wounded—such a scene could not fail to strike the least vivid imagination with a sense of its many-sided importance.

*Nursing in Japan.*—The Red Cross uniform for nurses was simple, clean and neat, consisting of a white cotton overall, tied with a cotton sash round the waist, and a high starched cap, which, although not becoming, had the merit of confining those stray

locks that prove a source of anxiety to the aseptic surgeon. This cap usually bore over the forehead the distinguishing mark of a plain red cross. There were no English nurses in the Japanese hospitals, and none were wanted. One English lady—a British officer's widow—had contrived in her enthusiasm to be employed in elementary work at Tokyo ; fifteen American nurses, headed by Dr. Miss Gee, found employment at Hiroshima. But the difference of language, custom and food entailed endless complications ; and, except in scientific knowledge, which can only be gradually and systematically acquired, the westerners had not much to teach the dainty-fingered, patient, light-hearted little nurses of Japan. The Red Cross Society numbered on its books, in the summer of 1904, 2391 nurses, 717 male attendants and 150 stretcher-bearers ; and more were without doubt under training, sufficient for all probable demands. Moreover it must be remembered that the Japanese work willingly for almost double the eight-and-a-half-hours' day which is considered the proper limit even in a London general hospital ; and finally, the Japanese nation had determined to carry this war through to a successful termination with their own unaided resources for the sake of the national credit.

*Medical Aid for Japan.*—The same reasons applied equally to the question of medical aid. An offer made to the Japanese Government in August of 1904 to raise and take out to Japan a band of young surgeons from England, to be supported probably by a

charitable fund in this country, as was done from a fund raised by *The Daily Chronicle* in the Turco-Greek War, was declined with thanks on the score of such help not being required. The reasons given above were doubtless largely responsible for this decision.

*The Hospital.*—The hospital at Sasebo, of 600 beds, in August, 1904, only half full, was built in ten pavilions of light grey wood, plastered on the inside, roofed in grey tile, simply floored in plain wood, standing two feet above ground on brick foundations, and connected by raised wooden corridors with overhanging roofs and wooden sides up to three feet from the floor. The spacious operating theatre, simply built with a proper view to light, space and cleanliness, measured 20 feet by 30, with walls 12 feet high and the unceiled roof rising another 8 feet to the centre of the room. Commendation of a cheap theatre may perhaps be challenged, but there is without a doubt much to be said in favour of simplicity in theatre-construction, seeing that, so long as dust and rain are excluded, surgical infection can only arise from unclean hands, unclean ligatures or unclean dressings. If this be admitted, it is best to have a cheap theatre which can be replaced at slight cost to meet the varying needs of successive surgeons and the successive stages of surgical opinion, and can be multiplied so as to permit of each surgeon having his own theatre, as he has his own wards. On this view it is wanton waste to spend money on marble halls with complicated patent tables and regal fittings,

as is too often the case in English hospitals—a relic of the early days of the Listerian era, when hospital gangrene was the chief foe of every hospital surgeon. The simple type of theatre is that which, with the partial exception of two in the University Hospital at Tokyo, was universal in the poor and practical country of Japan. Sweet are the uses of adversity.

*Japanese Surgery.*—The methods of the Japanese surgeons were those of the most advanced modern surgery all the world over. For years they had been trained mainly by Japanese and German professors, had been obliged to learn one foreign language, the one chosen being usually German, and had been encouraged to visit the German hospitals. They showed therefore the faults as well as the virtues of German methods. The operative surgery in each hospital was all done by the best surgeon, and not, as in our better London system, by many rising surgeons and capable students under the supervision of the chief surgeons, a system which trains many men to the best work and is probably to the actual advantage of the patients. The Japanese surgeons again followed the extreme modern school, whose confidence in their ability to exclude all sources of contamination from a wound was such that they employed no antiseptics; but to this end they had to boil even the tap-water in which they washed their hands. Experience, however, seems to show, in Japan as in England, that this confidence is not justified. One of their hospitals, at least, had had more than its fair share of suppuration. In other

words, the Japanese in this as in most departments of modern knowledge had adopted the most apparently thorough method known in Europe ; and they lacked as yet the experience which should show them, as it has shown us, where it is defective and must be helped out by the older method, the use of antiseptics.

A shipload of patients had just been admitted and we went into the dressing-room to see the wounds being carefully examined, diagnosed and recorded. Thoroughness and care were again the dominant notes. Everything was done promptly and efficiently, without the least bustle, worry or assertion of authority. Discipline in Japan is an instinct. The Röntgen-ray room was well fitted up, without superfluous complications—and it was a fascinating pleasure to watch the gentleness of the nurses in arranging and supporting the crippled limbs and patients for examination.

A large amount of the work of a naval hospital even in war time results from accidents on board ship, crushes and lacerations from machinery or falling spars, engineering tools and parts of guns. This affords, therefore, a good experience in fractures, in which it was noteworthy that Dr. Totsuka had almost abandoned the custom of operation, much favoured by many advanced European surgeons. The best splint-apparatus, however—that of Hodgen—was apparently unknown, although in common use in London.

*The Medical Side.*—The medical side of the hospital

was of little interest. The infectious ward was empty. Most of the cases were those of diseases common in peace time ; there were six of typhoid fever, a few of mild dysentery, and the usual proportion of internal disorders. Nursing—the most important agent after general health in the treatment of disease—appeared to be good, the staff consisting of six male attendants under one chief attendant for each ward, except in the case of two big pavilions erected by the Red Cross Society, in each of which 36 patients, 12 of them in five or six small rooms at the end, were nursed by a Red Cross sister and ten nurses, who slept in a house outside the hospital. The hospital contained cubicles for 20 officers besides 6 private officers' rooms. The medical staff consisted of 12 surgeons, and their hours during the war were from eight A.M. to six P.M. on all days, without any interval or remission, however easy the work might be. Much of their time was spent in the common room ; but the regulation induced many officers to find useful work to do that otherwise would not be done.

This rough sketch of the naval hospital at Sasebo would hold good also for the military hospitals of Japan, and will give a fairly representative idea of the principles that pervaded the medical work both of their army and navy. They had little more to learn from Europe, except the advantage of delegating responsibility, to which reference has already been made in regard to the surgeons ; they had at least one supreme lesson to teach Europe and ourselves in their absolute devotion to their

work, their unprejudiced survey and adoption of the world's knowledge, and the confidence that such knowledge, systematisation and devotion had conferred upon them. That lesson the British Empire has yet to learn.

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## CHAPTER XII

### JAPANESE RED CROSS

THE RED CROSS HOSPITAL was four miles out to the west of Tokyo and entirely the work of the Red Cross Society, who in June, 1904, were building hard to bring it up to 2000 beds. It had an imposing front, built of red brick and stone, in two storeys, for offices, stores, and class and committee rooms. The rest was of wood. Precautions against fire were conspicuously absent; there were no buckets or hydrants about, and Lieutenant-Colonel Hori, the kindly surgeon who showed me round, said they were outside the city limits and must depend on the military in case of fire. Half the hospital, including single and double rooms for 26 officers, and wards, all on the ground floor in separate blocks, for 750 men, was handed over to the army medical corps; the other half was worked by the Red Cross people themselves, under general army medical direction. The brightly polished black wood floors and posts and lacquer furniture in the officers' rooms looked very well with a few flowers, books and knick-knacks about; but the beds were old iron ones, of very heavy, primitive and indifferent quality.

The patients saluted me most courteously and were willing enough to talk about their wounds, through

Colonel Hori, to whom they showed considerable deference. The majority had fought at Nanshan, the second great battle of the war. Most of the wounds were all but well, and not of great interest to the surgeon. There were a few longitudinal wounds down the body or up the arm, received in the act of charging, but there seemed to be few aneurisms as yet. The most noticeable fact was that although most of the men had small wounds quite healed, and looked most robust and healthy, they were still to be kept in hospital for two or three weeks, as being better perhaps for their discipline and health than convalescing at home. These men at Tokyo were of course the slighter cases, filtered through the sieve at Hiroshima, where all serious cases were kept until quite fit to travel.

The men's wards contained wooden bedsteads, close together, and little else; all was of wood, clean, neat and airy; still more so the white-painted passages. Allusion has already been made in a previous chapter to the difficulties of sewage disposal in Japan, and this was more than exemplified, even in the newest ward blocks of the Red Cross Hospital. Otherwise it was hardly possible to find a fault.

One of the most striking objects I saw was a pair of beautifully light Wellington boots for marching—half the weight of our "ammunition" boots, and of course only half as durable—a question, therefore, for ordnance and transport to arrange, with sure military advantage. When the Japanese soldiers had sore feet on the march they were served out a pair of sanitary socks, with the divided toe, and straw sandals,

which would tide over the period of treatment and allow them at the same time to keep on the march, the life of a sandal under such conditions being accurately known.

The question of boiled water on the march came up in the course of my visit. One had heard much as to the discipline of Japanese soldiers, boiled water being provided for every man's bottle each morning and at intervals along the line of march, with the strictest orders against drinking from any other source. The Japanese colonel admitted that the flasks became emptied on a long day's work, often without any opportunity of being refilled, and that then the men probably had resort to ordinary pools ; but he thought this occurred only seldom. In any case there seemed to be very little typhoid fever, only a little enteric and dysentery, and no typhus, as had been reported, or other epidemic, at the front. Lieutenant-Colonel Macpherson's official medical and sanitary report in 1908 on the Russo-Japanese War—a well-illustrated and most unofficially interesting book—bears out this report. Tired and thirsty soldiers might occasionally escape the vigilance of officers and water-sentries and drink from an unprotected well ; but as a rule cleanliness was so ingrained, the regular lectures on health, even in the field, were so appreciated, the disgrace of illness from any preventable cause was so clearly recognised, that disease was far less rife than might have been expected from the hardships and exposure endured. It is interesting to find that Colonel Macpherson gives the sickness-rate per 1000 per annum of the Japanese forces in

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Manchuria as 590 as compared with a rate of 727 for our forces in South Africa, although the Japanese death-rate from disease was 41 as compared with our South African rate of 24.

At the close of the tour round the hospital we ended up in one of the committee rooms, where the European ladies, under the Red Cross Society, were busy rolling long gauze bandages, first by hand and secondly on machines—nice and tight but too long for our ideas—about ten yards. Every day ladies were at work—the Europeans one day, the Japanese five days a week, a most convenient way of keeping them busy and useful. The cynic might remark that it would save both time and trouble for the ladies to subscribe for the bandages ready-rolled ; but this would overlook the main object of a Red Cross Society, which is that of utilising, if not at cost price, then with as little extravagance as possible, the available labour of the voluntary helpers, especially ladies who wish with their own labour to help their countrymen in the field. Thus the authorities had come to terms with the Red Cross Society, and the ladies working under it sent off a few weeks before my visit 20,000 bandages, the result of months of work. Their bandages, as has been already related, had all gone down in the *Hitachi Maru* ; and so the ladies with courage had set themselves to work again, starting at seven o'clock every morning.

They were dressed in uniform—white overalls and caps—they had to scrub and sterilise their hands carefully beforehand ; and the bandages were sterilised both before and after being rolled. These were

all untrained ladies, under the supervision of one or two trained nurses, but there were some ladies with a little hospital training who were allowed to make "first field-dressings" in a special room for the purpose.

I was given one of these first field-dressings—to tell the truth, a poor affair, except that it cost fourpence instead of our eightpence-halfpenny. Let it be remembered that these first field-dressings were sewn inside the coat of every soldier going into action. They might therefore have to bind up the dirtiest and most extensive wounds for many hours, perhaps for more than a day, until the injured men could reach proper surgical aid. In the first place they had oiled paper with which to cover over the gauze dressing on a wound. At Wynberg, in South Africa, we early discovered the mistake of an impervious dressing, bottling in often large accumulations of pus. This oiled paper was in the centre of the packet instead of outside it, where in our own field-dressing we used to have a waterproof covering to preserve its asepticity. The Japanese dressing again contained only one safety-pin against our two. It contained no strapping, which is by far the most efficient means that can be given an uneducated man of fastening on a dressing to his wound; the gauze in the Japanese article was a piece, instead of a strip which might be wound round and round a limb, this helping to keep it in position; and, finally, the bandage was of the obsolete triangular form, instead of a roller bandage. At a subsequent visit to the Russian prisoners' hospital at Matsuyama, Surgeon-General

Kikuzi, a Fellow of our Royal College of Surgeons, took these remarks very kindly and appeared on the whole to agree with them, so that it is possible that the form of the first field-dressing in Japan may latterly have been materially changed for the better.

What then is this Red Cross Society, of which they talked so much during the war in Japan, and which appeared to include in its organisation, in one capacity or another, almost the whole population who were unable personally to go into the field? The society had its origin in the "Haku-ai-sha," or Society of Benevolence, founded during the Satsuma Rebellion in 1877 for the purpose of giving relief to the sick and wounded soldiers without distinction of parties.

This rebellion was the last smouldering embers of Japanese tory dissatisfaction with western reforms. In the year 1854 the first treaty with the United States was concluded, and in the year 1863 a British squadron bombarded Kagoshima as a punishment for the murder of Mr. Richardson, who had made the mistake of intruding near Yokohama upon the Daimyo of Satsuma's retinue. Thenceforward the province of Satsuma, in the south-westernmost corner of Japan, became the centre of political activity, the feudal chiefs in the island of Kyushiu maintaining their positions with much pomp and circumstance. This and the fighting qualities of the Satsuma men led to the Revolution of 1868, and the overthrow of the Shoguns or Prince-Regents of Japan, whose authority the Southern Japanese resented. But the same qualities induced still further dissent from the Europeanising policy which followed the resumption

by the Emperor of his proper power ; and so Saigo Takamori went out in rebellion, only to be suppressed after eight or nine months' active warfare, when the town of Kagoshima for the second time fell a prey to the flames, and Saigo, fighting bravely on a hill behind the town, saw that all was lost, and committed *harakiri*.

In the eyes of the law, the Kagoshima fighters were rebels ; many battles, great and small, had been fought between the insurgents and the imperial arms ; and the numerous sick and wounded on both sides were almost untended. It is a striking tribute to the humane virtues, which are often wrongly denied by western writers to the Japanese, that the association, first-organised by four of the Japanese nobility for the care of wounded, should have resolved on the fundamental principle of treating patients regardless of party—the outstanding principle of all Red Cross work.

It may be pointed out here that Red Cross work and the work of an army medical corps are different, both in principle and in practice. Their divergent aim is only now, with the advance of science and the experience of recent wars, coming to be recognised. The main principle on which an army medical corps must work is that of assisting in the first instance to maintain and increase, from a medical point of view, the fighting efficiency of the army ; the guiding principle of a Red Cross Society is the humane desire to diminish suffering at all costs. Now in practice it is clear that both the army medical corps and the Red Cross Society work with both ends in

view. The Red Cross people would naturally refrain, unless they were singularly devoid of tact—in which case, as occurred occasionally in South Africa, they would be made to refrain—from any action that would undermine the discipline of the army, or betray military secrets. On the other hand, the army medical corps, whose work is primarily that of preserving or restoring to health, with a view to military efficiency, the sick and wounded, would always, so far as possible, give effect to their humane sympathies, and endeavour to relieve suffering in every way. But, essentially, the difference between the two branches of work remains and has become more definite with each successive campaign. Occasions may and do occur when some sacrifice of life is necessary; when the wounded perhaps must be left for some time to take their chance; when the healthy, on the other hand, may perhaps have to be restrained in their action for fear of certain dangers to health. The advice of army medical authorities and the work of an army medical corps may therefore either lead to a greater freedom of the military power, by relieving it of sick and wounded, or it may involve a restriction of that power as a safeguard against sickness. Above all, their aim must be, as has been said, to maintain a maximum physical efficiency in the fighting force, and in organisation and methods of working to conform with perfect accuracy to the usual methods of army organisation and army discipline.

It must be admitted that this was not the original intention of supplying medical aid to our fighting services. That original intention was the same as the

desire which inspired Count Tsunetami Sano and his colleagues to found the Society of Benevolence, which has become the Red Cross Society of Japan—the natural desire, that is, so far as is possible, to relieve suffering. It was with this purpose that surgeons were formerly appointed in the British army to live and die with their regiments, and it is with this purpose that the work of our Royal Army Medical Corps often meets with the fiercest and most undeserved criticism, not only, I fear, in society and the Press, who may be excused for being less well-informed, but even in the army at large.

It was, on the other hand, by the growth of sanitary science—which the country owes very largely to Dr. Parkes, a military surgeon in the Crimean War—that the strategic advantage of saving life, of preventing disease, and of returning the wounded as soon as possible to duty, was discovered; and these discoveries have shown without a doubt the necessity to an army of prime attention being paid to this aspect of medical work. It was in keeping, not so much with this sanitary principle of strategy as with the accompanying principle of conformity with military procedure, combined with the advancement of surgery, that led in our army to the organisation of the Royal Army Medical Corps, with all its system of separate medical units, corresponding to the military units or stations, both in peace and war, and the extinction as such of the friendly but professionally decadent regimental surgeon. The change is certainly for the advantage of the patient in all serious cases; he is now no longer at the mercy of a man who

may never have seen such a case since his hospital days ; and, if time allow, he has at his command the advice of specialists in all branches of modern medicine. In dealing with large numbers of sick and wounded in the field, often on the march, under great difficulties of transport and sick accommodation, efficiency is only possible through a properly organised service, and it is at the front that the essentially military character of an army medical service should prevail.

But at the base, on the other hand, in war, and still more in peace, the two principles of military efficiency and individual relief are closely intermingled. It is well that voluntary agencies, which have only at heart the individual relief, should be allowed here to have full play ; for at the base-hospitals voluntary agencies can be kept properly in check under supervision of the army medical corps, and to give such free play is to the advantage not only of the patients but also of the workers, the friends and relations of their countrymen, anxious to share in the nation's work. It operates also for the general welfare of the nation in dividing responsibility with the public and in giving a vent to feelings which would otherwise result in much widespread discontent.

But voluntary agencies, when thus permitted to share in the medical work of an army, should remember—unfortunately they too often forget—that uniformity is the essence of efficiency, and that their own civilian efforts may be detrimental to the effective value of the army, may be a distinct hindrance to their country's cause, if not properly surrounded by

safeguards which will keep the train on the rails. Hence it is that military doctors exact and must exact respect for their authority and rank ; hence it was in South Africa that some of us young civilians found that our soldier patients would unbend to us as they would not unbend to the officers over us, and, in consequence, that they treated us with greater confidence and familiarity, and were correspondingly lax in the observance of our rules. The voluntary worker scoffs at the peremptory command, " 'Shun ! ' " shouted by the sergeant when the major enters the ward ; he derides the major's determination to have each patient's boots in the exact spot prescribed by the regulations ; he treats with some ridicule the diet-sheets and forms by which his work is circumscribed. But, when the occupants of his ward return to duty, it is the major-doctor that they will obey, and not the civilian ; it is the major-doctor who will be able to fit them to their kit, and estimate their fitness to return to the ranks ; it is the major-doctor who will err, if at all, on the side of strictness, in order to brace his patients up for further military use ; while it is the voluntary worker who will, without thinking, do his best to get every patient a holiday before he returns to duty.

Thus we see then the natural difficulties of employing voluntary aid in connection with the medical work of an army, and we see the difference in principle between the work of the official army medical department and the voluntary Red Cross Sisters. We see the need, in enlisting the help of voluntary workers, of bringing their work into line with the

usages, general administration and ultimate aims of the army.

These principles are admirably preserved in the constitution of the Red Cross Society of Japan. When the Satsuma Rebellion was at an end the Society of Benevolence made itself into a permanent organisation and took steps to prepare for relief measures in time of war. Nine years later, in 1886, Japan acceded to the Geneva Convention, and the Haku-ai-sha became the Red Cross Society of Japan, with its Christian cross and all. This society is semi-officially under the protection of the Emperor and Empress, the honorary presidency of a prince of the imperial house, and the management of a council, including in its forty-four members several nobles and gentlemen of distinction. The society is supervised by the department of the imperial household, as well as in other particulars by the army and navy. During the Chino-Japanese War the society sent out over 1500 helpers, and during the Boxer outbreak nearly 500, to give relief to sick and wounded on both sides. The experience of the former war resulted in the construction of two hospital ships to transport patients from the front to Japan. In this way, in the first campaign 181,428 patients were relieved, nearly 1500 Chinese prisoners of war being brought over as patients to Japan, and treated by the society; while in the Boxer trouble 11,348 wounded were relieved, including 123 French and two Austrian patients, who were brought to Japan from the allied forces.

The society does not confine its work to the calamities of war, but has also displayed the greatest

activity in the disasters that afflict Japan more than most countries in times of peace. In 1888, as a result of the eruption of Mount Bandai, 140 miles north of Tokyo, nearly 500 persons were killed and 40 wounded, and the Red Cross Society gave most useful assistance. In 1891 a stupendous earthquake, which laid waste two provinces in the centre of Japan, accounted for over 7000 deaths and more than 11,000 injured; the Red Cross Society at once rose to the occasion with a couple of temporary hospitals, nine ambulance carts and a small army of workers. Inundations again are of almost annual occurrence, and a tidal wave in 1896, which destroyed 20,000 houses and caused 21,000 deaths, as well as injuring 4000 people, was the occasion for the greatest relief work done by the society in peace-time. Railway accidents and fires supply other similar opportunities. The decision whether relief shall be given or not in case of any public calamity, and as to the way in which such relief shall be given, rests with the chiefs of local sections, assisted by the local councils. Either the local section of the society or the local authority may take the initiative. Food, lodging and coolie labour for the use of the relief staff are provided by the local authorities; expenses, however, even where the relief staff of neighbouring sections is invoked, must be borne by the local section of the society. Whatever use be made of its resources in case of public calamity, it is laid down that no interference shall be made with the preparations for the fundamental object of service in time of war. The society numbered in 1904 nearly 1,000,000 mem-

bers, and is arranged in local sections, organised under the general supervision of the central council in Tokyo.

The Emperor and Empress, besides giving an endowment producing £1000 a year, have so far identified themselves with the work of the society that it appears to be a matter of etiquette for all his Majesty's representatives in official positions similarly to give it their assistance. The royal patronage has been exploited to its utmost extent. This patronage was explained to the prefectural governors in Tokyo on the organisation of the society in 1887, and the Marquis Ito, then Master of the Imperial Household, enjoined them all to become chiefs of the sections established in their respective prefectures. The silver medal of membership is allowed to be worn on public occasions by the side of State Orders, and is considered a great honour ; a still higher decoration, a Medal of Merit, is awarded to those who have rendered special service in recruiting new members or otherwise ; and the attractive force of these decorations, contrary to what one might expect in Japan, is said to have been marvellous. The society is further popularised by annual local assemblies which have become the great social events of the year, including exhibitions of work in field-hospitals, with wrestling, fireworks and other entertainments. The desire of the rural Japanese to see royalty is shown by the fact that, when it was decided that the honorary president could only attend the general meetings of sections whose membership attained the proportion of 1 to 100 of the population, the number

of such sections rose in three years from 4 to 28, and at the time of my visit only 2 out of the 48 local sections were below the mark. The work of the society had been made known, even in distant villages, by the magic lantern, by various publications, and, for the previous fifteen years, by a monthly magazine entitled *The Japan Red Cross*.

It will be seen therefore that the Red Cross Society of Japan, although represented by local sections, is well organised at the centre. Indeed it has the advantage of having grown centrifugally, from the centre outwards, instead of starting, as a large number of local societies, with conflicting rules, and often conflicting interests, which it might be extremely difficult at a later period to reconcile and co-ordinate. These two different systems in the formation of Red Cross Societies were much discussed at the last International Conference on the subject of Red Cross work in St. Petersburg. The only effective argument against centralisation is the lack of local interest that may result from it. In Japan this interest, as we have seen, is ensured by various social functions and by the organisation of local sections, which, moreover, arouse the greater local interest by their active services in case of public calamity during peace. In Russia, where the opposite system is in force and the whole organisation is entirely decentralised, two or more local societies may even exist in the same locality, independent of each other, and the local societies are allowed to spend their income as they will. The result of this, as seen in Manchuria, was undoubtedly a very great display of munificence

in the provision of a large number of hospitals and hospital-trains by Red Cross agency, but also, as may be surmised, by absolute chaos.

Up to 15th July 1904 the Russian Red Cross Society had sent 138 hospitals to the front, with 15,000 beds, 400 doctors, 1750 attendants and 800 Sisters of Mercy. Many of the best Russian families had sent one member or more to aid in this beneficent work of charity, and various officials on leave had similarly assisted in the work ; but criticism, which is one of the most useful results of war, showed that there had been a great deal of speculation in the management of Red Cross funds. The Moscow branch had become a byword in this connection ; and the Moscow merchants, and many private individuals, Zemstvos and other associations—it was said—preferred to equip their own hospital-trains rather than entrust money for the purpose to the Red Cross Sisters. Prince Tusupoff had his own hospital-train running between Kharbin and Mukden ; and the Empress herself had equipped the most sumptuous train of which I have ever heard, with accommodation for some 200 lying-down patients, and an equal number of others, with swing cots on springs, with baths, kitchen and operating theatre, and complete arrangements for a staff of 4 medical officers, so many nurses and 36 attendants on each train. Indeed, Dr. Kanal, a most genial and courteous medical officer, ranking as a lieutenant-colonel and attached to the administration at Niu-chwang, spoke with some contempt of the superfluities of the Red Cross, just as one heard

similar complaints against some of the private hospitals in South Africa. A Russian banker from Kharbin had himself just seen their No. 20 hospital-train, and described the luxuries with which it was lavishly equipped. "How splendid," the tender-hearted supporters of the Russian Red Cross, or of the South African Imperial Yeomanry Hospital, might exclaim, "to think that the poor fellows will have every luxury that money can buy!"

But this is just one of the glaring fallacies from which Red Cross work must, in order to be efficient, be preserved by the army medical department. Apart from the leakage of luxuries, of which many instances could be quoted, the provision of extra luxuries in private hospitals makes for discontent amongst all patients who find themselves in the military hospitals, and makes therefore against the army medical department, weakening considerably the hands and the hearts of its officials. There can be no doubt that the only proper system is that of the Japanese Red Cross, which co-ordinates all private effort into one machine working directly under the army medical authorities, an undertaking being given that the equipment and supplies of the Red Cross units shall be of the same kind only as those supplied by government. Thus, all parts of the machine are interchangeable. When stores give out in a Red Cross hospital they can be supplied by government; when instruments or comforts are deficient in an army medical hospital they can be replaced by any that a Red Cross hospital may have to spare. Here still is abundant scope for charity. If the

government hospitals are not sufficiently comfortable, then they must be improved to equal the comfort which the Red Cross subscribers are allowed to provide ; while, on the other hand, if the Red Cross subscribers wish for further outlet to their charity, they must find it in providing more hospital accommodation on the same scale. Uniformity, as I have already said, is the soul of military efficiency.

A further lack of uniformity in the Russian system, to which we had some parallel in South Africa in the case of Militia, Yeomanry and Volunteer Medical Officers ordered out to the war, consisted in the miserable pay—144 roubles, or £14 a month—allowed to Reserve Medical Officers drawn from civil life, who had been excused military service in peacetime in return for an unpaid liability to be called out in time of war. Many of them had therefore been obliged to throw up their practices, and for £168 a year to support themselves on active service, and their wives and families at home.

Not only had private charity in Russia during the late war to cope with the difficulties of bad organisation and military apathy, but, when they took matters into their own hands, the public had frequently to face the often insurmountable obstruction of peculant officials. An association of nobles in the south of Russia—so I was confidently informed—equipped a special ambulance for the war ; all the preparations were complete, and the train was ready to start, but the requisite official permission was repeatedly and for no given reason delayed. One of the members of the association went personally to

St. Petersburg on the subject, and finally discovered the cause of the trouble in a certain highly-placed military official. A substantial *douceur* having been provided, all difficulties vanished, and the ambulance was allowed to proceed.

I was told again of a former chief of police who had been dismissed and imprisoned for peculation some years ago but was sent out by the Red Cross Society with the sum of £60,000 to be expended in the Far East. The whole sum disappeared—none of it on the objects for which it was intended—and impudent bribery had gained such a foothold in official circles that the ex-chief of police was recalled and given another appointment at headquarters. The evidence one picks up in war-time and at the seat of war must without doubt be taken with a double pinch of salt ; but the evidence on this point was too general, too succinct, to have been far wrong.

In the forty-nine prefectures of Japan, including Hokkaido and Formosa, local Red Cross sections are instituted, partly by the officials of the local governments and partly by the functionaries of the society. They are assisted by a council of influential citizens ; their headquarters are often in the local government offices ; and local committees, with the mayors as their chiefs *ex officiis*, are formed in all cities and country districts. Besides a few honorary members of the imperial family, membership of the society is either special, following on special service or the donation of £20 and upwards, or ordinary, entailing a donation of £2, 10s. or an annual subscription of 3 yen (or florins) for a period of ten years. In

addition to these subscriptions, donations and legacies are also made by private benefactors, and grants by the imperial household. Of the income of the society a part goes to the local sections in the proportion, firstly, in Formosa and Hokkaido, of 54 per cent.; secondly, in prefectures where there are headquarters of army divisions or naval stations, of 40 per cent.; and, thirdly, in other prefectures, of 35 per cent. The remainder goes to the central board.

The funds of the society amounted to over 8,000,000 yen, or £800,000; the annual subscriptions in the year in question were 2,354,558 yen, or nearly £235,000. In the summer of 1904 the staff of the society included 314 physicians, 129 dispensers, 2391 nurses, 717 male attendants, 150 stretcher-bearers, 87 clerks and 5 administrators. As a retaining-fee administrators, physicians and dispensers received 6s. a month; assistant dispensers and the chief male attendants, 3s.; other male attendants and stretcher-bearers, 1s.; and nurses, nothing. This lack of pay to the nurses is justified by the fact that they have received a gratuitous training, which enables them to find good employment. On being called up for active service, or for manœuvres and other instruction, or for assistance in the case of public calamity, some "departure money" and travelling expenses are paid to them, and a salary so much better than that paid to members of the army medical service as is justified by the fact that they are summoned from civil life to undertake their duties.

A special feature of the preparation of this reserve is the training of its members. The society contracts with certain chosen medical students in the imperial universities of Tokyo and Kyoto to pay the expense of their education, on condition that, on graduation, they become reserve-physicians of the society. They are then attached to the central hospital of the society in Tokyo, where the famous Dr. Baron Hashimoto decides on their efficiency. One or two of these young doctors are always studying in Europe at the expense of the society, but for the present it would be impossible to train their whole staff, and certain physicians trained in private medical schools are engaged on the reserve of the society, and instructed in the special duties of military work by appropriate courses of lectures.

The training of nurses is of greater interest, because it strikes new ground, and has a wider social effect, in opening to the women of Japan a calling which had not previously been held in good repute. In so essentially aristocratic a country, it required some courage and much tact to overcome the stigma that naturally attached to the work of the sick-nurse. The step was taken by certain ladies of high degree, who boldly faced the situation and designedly inaugurated the new system, with the result that the stigma had by 1904, at least in the main centres, entirely died out. Candidates for the nursing staff of the Red Cross Society, between the ages of seventeen and thirty, are admitted, after an examination in elementary subjects, to a three years' training at headquarters or under the local sections, either in

hospitals of the society or by a specially instituted training board or in private hospitals. Uniforms and outfit are lent to them, and a monthly allowance made of from ten to fifteen shillings for pocket-money. Emphasis is evidently laid on the scientific side of their training, for the first year and a half is devoted to theoretical instruction and only the last half of their training to practice. After successfully passing their final examination, they enter the reserve of the society under vow. The best are selected to undergo a further six months' training under Baron Hashimoto at Tokyo, and, if they successfully pass a further examination, they are nominated chief nurses as vacancies may occur. During the period of their vow the nurses are eagerly sought after in hospitals and for private work. They may marry if they like, but they remain at the call of the society ; and now the society has created at headquarters a " Board of External Service " for the nurses, practically a nursing institution, which receives all fees and pays the nurses an annual wage.

The training of male attendants is an easier matter. Perhaps it should be taken as a compliment to the greater ability of the male mind that a training of ten months is considered sufficient for the male attendant ; his age is from twenty to thirty-four, and his allowance double that of the nurses—viz. sixteen to thirty shillings a month. Of this training the first five months are spent in theory, and the remaining five in practice in hospitals of the imperial army. The men are thus brought up in the atmosphere of military organisation as the very breath of their

nostrils. The best are selected for a further two months of study, with increased allowance. Unfortunately, they can find after graduation but little private employment, and so they are given frequent exercise at their duties in manœuvres, and, whenever possible, in cases of public calamity.

Stretcher-bearers form a fourth class for whom training must be provided. They must be under thirty-seven years of age, and, during three months' training in the art of transporting the sick and wounded, they are taught such useful sundries as the improvisation of ropes and stretchers, their ingenuity in this line being probably unequalled in any other army in the world. During this training they receive a monthly allowance of thirty shillings, with uniform and outfit, and the best are given a month of further training, which qualifies them for appointment as chief stretcher-bearers. They too can find but little private employment as such and there is some difficulty in recruiting them.

The vow of all nurses is for fifteen years ; that of male attendants, ten years ; of stretcher-bearers, seven years ; of physicians, dispensers, administrators, clerks, chief attendants and chief stretcher-bearers, five years. For nurses, dispensers, physicians and administrators, the retiring age is fifty-five ; for all others, forty-five.

To understand the careful way in which the work of the Red Cross Society is sandwiched in with that of the army medical department, and the whole embodied in the general military system, instead of being a mere appendage, it is necessary briefly to

describe the scheme on which the medical service both in the army and in the society is organised. After the Chinese War of 1894-1895 missions were sent over to Europe to study the work of sister-societies. In accordance with this mission, in consultation with the military authorities, the first regulation for relief service in time of war was ratified by the minister of war in October, 1898, and put into practice in the Boxer troubles in 1900, which suggested certain modifications embodied in its newer form in November, 1903. In a campaign the sphere of military activity is divided into three zones—the base; the lines of communication, or *étape*; and the front. At the front the sanitary corps and the field-hospitals are administered under the direction of the chief of the medical staff of the army, or of the divisions composing it. Along the lines of communication the transport of sick and wounded and the maintenance of hospitals are carried out under the chief of the medical staff of each line of communication. The base is divided into so many territorial divisions, each with its medical service under a chief who administers the affairs of the base-hospitals. Attached to imperial headquarters, which may be situated at the base or on the lines of communication, is the director-general of field sanitary service, to whom the chiefs of the medical service on each line of communication are directly responsible.

Such being the organisation of the army medical service, that of the Red Cross Society follows it closely. The reserve-hospital and rest-stations at

the base are under the direct control of the president and the chiefs of local sections, who are in touch with the commanders of the corresponding territorial divisions. To imperial headquarters is attached the general administrator of the whole society, whose function it is to direct and control the service of all the relief corps of the society sent out to the lines of communication. These corps work only at the base or on the lines of communication; and their work appears to be good; but there appears to be one slight flaw in the arrangements. The general administrator of the society takes his orders only in medical affairs from the director-general of the field sanitary service, in others from the inspector-general of the lines of communication. He works similarly through his administrators, one for each line of communication, who in their turn take orders only in medical affairs from the chiefs of the medical staff of their lines of communication, but otherwise from the inspectors, who are purely military officers. The relief despatched by the society to the lines of communication takes the form of relief corps, under a manager, who again takes his orders in purely medical affairs from the chief medical officer of the locality or unit, but other orders from the military or naval authorities, subject always to the instructions of the administrator along his line of communication. As a rule the manager of such a relief corps is not a physician. The society's service, therefore, is working under two separate authorities, medical and military, as is the army medical service itself; in professional duties only are its agents under the

control of the medical officers of the military service. Such a system must entail much extra trouble and delay; a military service should, subject to its general subordination to military command, be able to manage all its own affairs by itself.

The relief corps of the society consists of separate detachments, which are found far more useful to the army than separate hospitals. The relief detachments have as their standard an organisation reckoned to treat 100 patients, with 2 physicians, a dispenser, a clerk, and 22 nurses or attendants. Of 112 such detachments for the army and 4 for the navy in 1904, 94 were formed with nurses, and they alone were used at the base; 18 were formed with male attendants, and they were more frequently employed along the lines of communication. Three relief corps are organised as transport columns, calculated for the transport of 30 specially serious patients, with a manager, a physician, a clerk, 5 attendants and 123 stretcher-bearers. Two relief corps are organised in the equipment of two hospital-ships—one for 200 and the other for 100 patients—in which corps, in time of war, it is interesting to read that a mechanic, an interpreter, a barber and a washerman are also included. Another relief corps is organised as a supply dépôt for medical and sanitary material, for clothing and bedding, and for stationery, to work on the lines of communication. In time of peace only one such dépôt is kept ready, but in war others may be formed at once. Finally, the Red Cross Society organises in Japan rest-stations at ports of disembarkation, and at railway stations through which patients travel,

the regulations and the staffing for such rest-stations being left entirely to the local sections of the prefectures in which they are situated.

It will thus be seen that the organisation of the Red Cross Society is complete and independent. The material needed by the relief corps serving at the base is supplied directly by the headquarters of the society ; that required by relief corps on the lines of communication by the supply *dépôt* in the field. Rapid mobilisation is ensured by two detailed reports of the preparation made for the purpose for the coming year, presented by the president of the society to the ministers of war and navy before the end of September in each year. On receiving these reports the ministers assign to such relief corps as are likely to be needed fixed services in the naval and military systems in case of war. The whole plan of mobilisation, with the necessary orders—already as far as possible printed—is stored away at headquarters and with the local sections, so that only the date, names and time and place of formation have to be filled in before issue. The distances of the abodes of different members of the corps are kept in a list, so that it may be known exactly in how many hours orders can reach them.

Baroness Sannomiya's kind invitation took me on 1st July 1904 to the Red Cross Society's *dépôt* and store, in a different part of Tokyo from the hospital. The ladies of the Red Cross had formed a volunteer aid society, which, with all other voluntary bodies concerned with the bodily and monetary relief of soldiers and sailors and their families, was co-ordinated

under the Red Cross Society ; and of this a small donation had made me a life-member, with medal, ribbon, button and certificate in Japanese characters, signed by the Emperor, complete. The Baroness Sannomiya, an English lady, and wife of the Master of the Imperial Household, was the heart and soul of the ladies' organisation. She herself on the occasion of my visit showed me all the details of the work, introducing me to several of the workers. An elderly, white-bearded doctor, retired from the Japanese Army Medical Service, was giving his weekly lecture on bandaging and first-aid on a dummy to a large roomful of little native women in sandals, Japanese costume, and elaborate coiffures, associates of the Red Cross Society ; "such an excellent thing," as the baroness said, "for their homes, if not of very great importance to the army." The nobility appear on these occasions—for evidently their presence is a considerable attraction to the people—as, for instance, two delicate little ladies of royal blood, besides the Princess Nashimoto, whose husband was on his way to the front and who talked of photography in eager French. A fourth lady, who sat with them in an alcove of the room, and with whom I made a vain endeavour to shake hands as with the rest, must have been a lady-in-waiting ; and bustling about in the crowd were Baroness Nobeshima, mother of Princess Nashimoto and wife of the only daimyo who takes any prominent part in public affairs, and Marchioness Oyama, who has lived for some time in America, and spoke charmingly in fluent English of her many Anglo-Saxon

friends. In a corner were two or three large cards, on which were mounted about fifty models, beautifully made, of every kind of improvised stretcher and carrying apparatus for sick and wounded. To my intense delight, the Red Cross Society, at the instance of the baroness, subsequently made and sent me as a present a replica of these beautiful models, which are now exhibited in the museum of our Royal Army Medical College at Millbank.

Two kindly Japanese gentlemen showed me round the vast stores, in which, without being able to understand their comments, I noticed several useful improvements on our South African equipment—light and handy trunks instead of our clumsy and heavy hide-covered panniers; scales on the Danish lever principle; measures and cups of hard paper; paper for use as mops in surgical dressings; powders already made up in little paper packets; stomach and rectal rubber tubes; and a really useful and intelligent selection of surgical instruments. They had good cases of carpenters' tools, presumably for the purpose of making splints and stretchers. Their warm quilted clothing looked at least extremely comfortable—if it wears well and does not become infested with animal life, it would be of use for our own or our Indian army in cold climates. In only two points—their lacquered aluminium water-bottles and their supply of “gooched” wood for splints—should I say that we in South Africa had the advantage.

I have treated at some length of the constitution and work of the Japanese Red Cross Society, for some effort is now being made in an interval of peace

to organise our own scattered and conflicting instruments for voluntary relief in time of war into an effective machine, on a recognised basis, with recognised duties and responsibilities, professedly after the foreign model. It is unnecessary to dilate upon the waste of money and material that resulted from the lack of such organisation in South Africa; it is unnecessary to labour the jealousies and rivalries to which it gave rise and the diminution of authority, of efficiency and of subsequent credit which it imposed on the Royal Army Medical Corps. What is necessary is to drum three ideas into our countrymen's heads: firstly, that whatever may be our belief as to the moral or even commercial value and as to the feasibility of abolishing war, no such beliefs in the positive are shared by continental nations, from which it follows that war may come on us even this year, as on France in 1870, as a thief in the night, and against that calamity we should prepare ourselves, insure ourselves, forthwith; secondly, that preparation for war makes a most attractive and practical framework for the citizen's duties in times of peace; thirdly, that the movement should be national, not sectional, the burden spread over the whole populace and not confined to those who realise their duties most keenly.

To this end in 1898 a "Central British Red Cross Council" was formed of representatives from "The National Society for Aid to the Sick and Wounded in War," the St. John's and St. Andrew's Ambulance Associations and the Army Nursing Service Reserve, with three representatives of the War Office and one

of the Admiralty. To this end, after the South African War, in which the National Aid Society spent £162,000, these bodies were fused in 1905 into a single British Red Cross Society, with King Edward as patron; Queen Alexandra, president; Lord Rothschild, chairman of council, and Sir Frederick Treves, chairman of the executive. To the same end, in co-operation with the British Red Cross Society, the War Office in 1909 initiated a scheme for the organisation of voluntary aid detachments under the county associations responsible for the territorial force throughout Great Britain. Of these voluntary aid detachments there were 415 at the end of January last, with a personnel of nearly 4000 men and over 8000 women, or 12,500 in all.

The peace value of this organisation is likely to be considerable, owing to the requirement by the War Office that candidates for the women's detachments should be either trained nurses or cooks, or should be in possession of certificates for first-aid and in home-nursing. For this purpose lectures are being given and classes held in the basis of a syllabus alike to that of the London County Council. Combined with the boys' and girls' scout movement this should serve to raise very materially the knowledge of the rules of health and to stimulate public opinion as to their value. It is on this general knowledge and appreciation of the rules of health that the health of the nation must ultimately depend.

But the Red Cross Society has as its primary object the furnishing of aid both to the navy and army, both to the territorial and to the expeditionary force, in

time of war and for this object to promote the organisation of Red Cross work throughout the Empire as well as at home. In case of war it would propose, following the precedent set in South Africa, to equip hospital ships and trains, provide auxiliary hospitals and convalescent homes, make supplementary arrangements for transport of sick and wounded, establish food-dépôts along lines of communication and supply certain articles of clothing and comforts over and above the official requirements.

The Red Cross Society might also perform a most useful function in supplying additional personnel for the medical services of the army. Machinery should be established through someone of influence at each medical school, for the selection, when required, of suitable young surgeons, on whom, however, any retaining fee is absolutely thrown away. A still greater difficulty in the South African War was that of supplying the need of male nurses ; and for this purpose arrangements should be made, in connection with the work of the voluntary aid detachments, for civilian hospitals to undertake the training of male nurses, of whom there is always need for a few in the casualty ward and strong-room.

Owing to the better organisation of our army medical department, especially since Mr. Brodrick's reforms, the work required of a British Red Cross Society is less essential to the welfare of the navy and army than that required of the Red Cross Society of Japan. But it must be remembered that the standard of comfort desired, if not demanded, for the sick and wounded in the field differs widely in the two cases ;

the standard of comfort to which the soldiers and sailors of the two island powers are accustomed in times of peace is very different. Moreover it is essential to give scope for the activities of those who, full of patriotic feeling and of sympathy for the combatants, are themselves debarred from fighting. The actual value of the bandages rolled in the Red Cross dépôt at Tokyo may have been small; the moral effect of those classes was very large. The extraordinary influence which the Emperor and Empress of Japan and the leading Japanese nobility have brought to bear with effect on the formation and triumphant working of their Red Cross Society gives warrant for an earnest hope that their Majesties, King George and Queen Mary, may similarly succeed in consolidating a work of such great beneficence to the individual soldier, of such great importance to the nation, under a Royal Red Cross Society extending to every corner of the British Empire.

## CHAPTER XIII

### THE AFTERMATH OF THE RUSSO-JAPANESE WAR

*The International Rank of Japan.*—For those who read with understanding, or have been privileged to see something of latter-day Japan, it is difficult to write without an undue use of the superlative. There can be no doubt as to the completeness of her victory in the recent war, both on land and sea ; none as to the thoroughness of her official preparation for the struggle, or the sympathy with official action that saturated every class of her people ; none as to the simplicity and natural power of her domestic life ; no doubt, in short, as to her first-rate equipment for competition with other great nations of the world, or her paramount naval and military supremacy, at least amongst all powers east of Suez. We Englishmen and our American cousins are above all qualified to appreciate the significance of her unique and rapid rise to this position. Our own defeat of Spain and Holland in the sixteenth century and subsequent mastery of the waterways of the world ; our own conquest or colonisation of North America, of India, of Australia ; our permeation of Africa ; our European victories a century ago ; the spread of our flag and of our trade in ports of all the seven seas and the lands behind them, enable us to imagine

the significance of the recent rise to power in Asia of a nation with a history, strategic position, resources, spirit and temper in many ways like our own. In relation to the oceanic world, the United States hold the keys of America; Great Britain, for the present, of Europe, Africa and Australia. Japan seems destined to hold the keys of the Asiatic continent.

This stipulates, without a doubt, a certain faith in the commercial abilities of the Japanese people, with an expansive power to stimulate the growth of a large merchant-fleet and necessitate the constant efficiency and the increase of her navy and army. If so we read the facts, we must grant to Japan the first position on the waters between at least the Straits of Malacca and the American coast, north of the Panama Canal, and the Indo-Australian ocean-road.

*The Aims of Japan.*—If we rightly understand the motives and ambitions of our eastern ally, it would seem certain that her object has been no mere military triumph, but a stable condition of affairs in which she may have full opportunity to develop her commercial activities. She has thrown off the corset to give her body full play. In establishing, therefore, her new position in the hegemony of the world, she would above all seek to establish international peace on the sea and secure equal rights and opportunities for her trade with other nations that may in trade be her rivals. In the recent war she has striven not merely to defeat Russia, but to establish her independent power and prestige in the sight of all nations. It is not least for that reason that she

prided herself on her financial achievements, that she conformed strictly to the properties of western diplomatic usage, that she refused all offers of help from outside, even from myself and others in the care of her sick and wounded, and showed a noteworthy advance in her humanity since her war with China ; and that she steadfastly preserved the integrity of the ring round herself and her late antagonist. It was not least on these grounds, we believe, amongst others, that she was content to forego many of her demands that appeared legitimate and reasonable in the final negotiations at Portsmouth, since the ultimate terms assured in some degree the future peace of the maritime world, as well as freedom for Japanese expansion on the Asiatic continent. It is these facts that suggest a practical policy for adoption in the interests of universal peace by five chief nations of the world.

The suggestion was made while Russia was still at war with Japan, while Great Britain, in addition to her traditional distrust of Russian policy in near and middle east, was fired by the admiration of her valiant ally and was smarting under the provocation of Rojdestvensky's exploit in the North Sea. The suggestion, recorded in ink and rejected by two monthly reviews as premature, in 1905, is already in 1911 to some extent an established fact and out of date. Its prospect is therefore encouraging.

*The Five-Power League.*—This proposal is inspired by the success that has already attended King Edward VII.'s most remarkable diplomatic achieve-

ment, the cordial agreement between Great Britain and France. For half-a-century these two nations had been at loggerheads. In one diplomatic movement these difficulties were frankly recognised, considered and swept aside ; each nation acknowledged the legitimate aims of the other, and by a scheme of give-and-take they now appear before the world as the staunchest of friends. As with France, so with Russia. The Crimea, India, Persia are no longer a source of contention and distrust. The mid-east has to count now on our co-operation, not our rivalry ; and in her struggles for peaceful development at home Russia draws nearer to Great Britain every day.

There is then a certain basis of fact—the alliance between Russia and France, the agreement between France and ourselves, the no less remarkable alliance between ourselves and Japan, and the friendly sympathy of our kinsmen in the United States. There is already a definite knot connecting every pair of nations here named, which thus constitute a girdle of power, beginning with Japan, passing across North America and the Atlantic to ourselves and France, ending in European and Asiatic Russia. Since agreement has now been confirmed between the two ends of this chain, whose extremes met in the recent campaign, the circle is diplomatically complete and the world girdled by a zone of powers, content with the present disposition of the earth's surface and therefore intent on peace. This war we look on as the necessary preparation for such an arrangement. Before the war Russia did not realise

the strength and the future of Japan; it is not certain that Japan or the other great powers of the world yet fully realise the strength, still less the probable and legitimate future, of Russia. It was impossible, without some such understanding, for Russia and Japan to come to terms. That being now effected, it will now also be possible for the five nations in question to agree upon a general policy.

*The Effect of Improved Communications.*—The full significance of last century's achievements, through steam and electricity, penny postage, national education and the Press, has not yet been fully realised. Is it not a logical result of these inventions that no national or international act between civilised powers can now be done in secret? Did not these very agencies avert the most serious issue in the case of the Dogger Bank incident, when their absence might have precipitated a second battle of Navarino? Differences and mishaps such as this may then surely and invariably henceforth be settled between peaceable nations by agreement; and the peaceable attitude may be no less surely prepared by a deliberate and comprehensive survey between all nations of their respective strength and interests and by a series of *ententes*, at first between nations already friendly and then between those reputedly hostile. The loss is in each case small, the loss of any advantage that might have been obtained by bluff or other war-endangering device. The advantage would seem in proportion great, the businesslike advantage of national security in the

pursuit of acknowledged aims, coupled with the active help of the co-operating nations in their pursuit. The loss appears ever less as the influence of last century's scientific progress becomes more clearly realised. This is the true method of preventing war, apart from the inculcation of the idea that peace is desirable. It is operating now and has already prevented war ; and it can always claim a precedent in that duelling has ceased in England for nearly a century.

Arbitration is quite another thing. Arbitration between two powers who have come to blows without a previous understanding and without the desire for peace is of little value ; and we may be grateful to the German Chancellor for reminding us that might is still right in the eyes of many and that arbitration in those eyes is valueless. Grant, however, the understanding and the desire for peace, as in the case of the United States and ourselves ; and arbitration will become a useful and natural method of settling disputed points. Arbitration is diplomacy in public ; but it cannot enforce its conclusions on nations who may deny their justice and have power to resist them.

The advantages of mutual understanding are advertised by each successive international agreement, great or small. In a game of bridge, beginners play every hand through to a finish ; experts throw their hands on the table, three, four or more tricks before the end. Politics is but a game of cards for heavy stakes. It is generally a game of bridge, not of whist, with at least one dummy hand exposed throughout. We have so many tricks, let

us say ; for we have one or two leading cards in our hand. You take the rest. Let us count the score.

*The United States.*—If then the understandings and agreements between France, Russia, Japan and ourselves be likely to prevent international war, so much the more probable and effective will be the inclusion of the United States in this group. The proposals for fiscal reciprocity between the States and Canada, their common interests and growing communications with Australia, New Zealand and the United Kingdom, are drawing the States closer to each dominion of the British Empire ; while their relations with Japan on the one side and France on the other are free and friendly. If only for selfish reasons, they must, like ourselves, desire the world's peace. They would not, therefore, enter into any such powerful combination, if such action were viewed with hostility, for instance, by the triple alliance. For that reason the agreement proposed must develop slowly and naturally ; understanding with other powers must develop concurrently ; but public attention must for practical reasons be focussed on the agreement of the five powers as the first aim.

*The Triple Alliance.*—It is an age of large concerns ; and this proposal aims at concentrating the most active powers of the world into two definite groups, the five-power chain to match the triple alliance. But the friendship between ourselves and Italy should act like the understanding between ourselves and France during the Russo-Japanese

War, when feeling ruled high under much provocation between this country and Russia. Italy might be the means of gradually accustoming the chain and the triple alliance to understand each other's power and aims. Surely a comprehensive understanding is more likely to be effected by first grouping the powers on two sides than by a series of partial understandings between each pair of the eight powers concerned. This possibility is made more likely by the increasing co-operation between Germany and ourselves in the near and far east, by the increasing facilities for the expression of international opinion, by the more widespread appreciation of the burden of armaments, and of the hindrance it imposes on commerce and therefore on national prosperity. In a general understanding between the chain and the triple alliance lies the best, if not the only, hope for the limitation of armaments and the cessation of war. But the understanding must come first.

*The Danger of Further Understandings.*—But the danger of this policy must be freely stated for it to be avoided. In seeking friendship with the triple alliance we shall be endangering our friendship with France unless it is clear that the one is dependent on the other. No major diplomatic agreement therefore is desirable between individual nations on either side, except by the consent of their partners. Such no doubt is the policy of our diplomatic service at the present day. It needs to be impressed also on public opinion.

So in the same way closer direct relations between our dominions and other, even friendly, powers must tend to loosen the bonds of Empire, and should only be entertained concurrently with the progressive consolidation of the Empire.

*German Expansion.*—And meanwhile we must go armed to the teeth. Nothing strikes the British traveller more, if he is concerned in world politics, than the astonishing growth of German influence in all spheres of modern life and in all parts of the globe.

Saturated at home with his original articles and text-books, newspapers and blue-books, in every case comparing British conditions more especially with German and showing an extraordinary development to the advantage and credit of Germany during the last thirty years, the Briton sets out on a holiday to Switzerland or the Riviera, and finds the German competing with him again in the wealth and leisure hitherto considered the monopoly of the Englishman and the American. He travels to South America or the States, and the German is there also ; to each port in the circuit of Africa, and the German is established in every one ; to the most distant lands in the Pacific, and German commerce is growing. In Singapore—the naval and commercial cross-roads from Europe and India to Australasia and the far east—the business men seem to be mostly German or Dutch, and the finest building of the sort is the German club-house. Both there and in Hong-Kong the proportion of German shipping had, at the time of my visit, been steadily increasing, and

the German leasehold of Kiao Chau was being methodically developed as a centre of German commerce and power in celestial waters.

This is no occasion for jealousy; the British character is not selfish, and indirectly British commerce takes its share of any commercial development, except that behind closed ports. But would a German Sir Walter Raleigh rest content in the present day? There is every need of anxiety, for we have everything, Germany little, to lose by a war; we occupy with a scanty population many of the countries best suited for development; Germany, longing for similar outposts, is bursting with commercial and imperial energy. She will soon have usurped the jingo song:

“We’ve got the men, we’ve got the ships,  
We’ve got the money too,”

and when the favourable opportunity occurs and the military party in Prussia see their way, it will then go hard with our empire in the Pacific, unless in every vulnerable quarter—and Australasia is the most vulnerable,—unless in constant proportion to rival powers, we go armed to the teeth.

*The Function of Navies.*—A self-contained country with peaceful intentions requires little of a navy for the protection of its coasts and its commerce. But extension of power and of commerce requires naval strength; and a scattered empire requires naval strength. A navy is above all required for the protection of commerce, and must bear a definite proportion to the amount and vulnerability

of trade it has to protect ; that is the justification for expanding the British navy. But the navy gives power in every sea, and no country with growing energies can submit to be permanently subject in every sea to the dominance of its rival, on whose motives and justice it cannot feel sure. That is the reason for the miracle of the German navy. Neither country can object to the naval policy of the other ; but interests are bound to clash, and even the most peaceable intentions for settlement are in fact subject to the final arbitrament of war, either latent or realised. The sooner we rivet up the five-power chain the sooner will it be possible to come to a general understanding with the triple alliance, to reduce the probability of great wars and to set free money now spent on the arts of war for the more productive arts of peace.

*China.*—We shall be none too soon ; for the nations of the west are in face of a greater danger than war between themselves, a greater danger than war itself. China, the most peaceful of nations when undisturbed, the least ambitious because the most assured of its pre-eminence, has against its will been enlightened and aroused by the forceful intrusion of the European powers. Actuated for the most part by the internal impulse of expansion, to some extent by a partial benevolence towards the Chinese, they have insisted on a policy of peaceful penetration, grounded on force. Portugal and England, Russia and France, Germany and the United States have all assisted in this policy in China, a policy, indeed,

applied not specifically to China, but generally to the whole non-Europeanised world. Regardless of other civilisations, ignorant of other codes of morality and justice, of other standards of happiness and prosperity, Europe has insisted on disturbing the social equilibrium of every race unable to withstand interference, in order to do away with injustice, to do away with the gamble in life, to force their treasures and their labour into the world's market and to force on them the consequent discontent which leads to luxury, revolution and the misery inseparable from international competition. Japan was the first to take up the challenge. Fifty years ago the Japanese were the toythings of Europe; to-day they are a power of the first class. Ten years ago the Boxer outbreak showed the strength and weakness of China to the world and to herself; even five years ago her professed intention to abolish the opium habit was regarded as a trick; to-day it is on the way to accomplishment. She is building railways; she is building up a constitution; she is learning European inventions and sciences; she too is entering the "comity" of nations. When China too begins to preserve life and to swell with the desire for expansion, in which direction will she expand? Through inhospitable Thibet into India? Through Turkestan into Russia? Or across the seas to the vacant lands of Australia? "Eventually," said Li Hung-Chang once to one of my fellow-travellers, "you will all have to go; unless—you stay behind as coolies." And Sir Robert Hart has told us that a Viceroy exclaimed: "Fools, you Europeans, trying to wake

us up to military power. We don't want it ; but it will come now, and you will be sorry for it."

*The Real Yellow Peril.*—But there is no need to presume she will have to use the force that will inevitably be hers, with her one-fifth of the world's population, and her national characteristics of wisdom, ruthlessness and endurance. She too is already adopting a reciprocal policy of peaceful penetration. In Singapore all the shops appeared to be Chinese ; in Perák the big villas belonged to the prosperous Chinese ; the Malay States were depending for revenue and for development on tin, and the tin mines on voluntary importations of Chinese ; Kuála Lumpúr, their capital, in a population of 32,000 at the last census in 1901 numbered no less than 23,000 Chinese. The boat which took me from Saigon to Hong-Kong under an English captain was one of the old blue-funnels of the Holt Line, which had sold its Borneo steamers to the Nord-Deutscher Lloyd and this boat and another to a Chinaman, once an office-clerk in Hong-Kong. In every country round the Pacific the Chinese are known to be the most honest and the best workers, either as labourers, clerks or merchants. Force China into the world's markets and she will beat every one of her rivals to whatever extent she may please. She is so being forced ; her appetite is being whetted ; our European imports are rammed down her throat and Chinese exports must in return be exploited abroad. As yet the competition is little felt, felt mostly by those firms whose secrets China has, as yet indifferently,

learned, and whose services are now superseded in China's home markets. And when Chinese manufacturers enter foreign markets, they must at first be handicapped by distance and by experience. But that will pass and then the yellow peril will be realised. Personal industry, intelligence, numerical strength and an incredibly low wage combine to make China a commercial power in the future with which there would seem to be no possibility of competing. A rising physician, a young Scot, once told me his ideal laboratory would be worked by Chinese, supervised by Germans and directed by himself.

*The Birth-rate.*—The numerical strength of the Asiatic powers is no small factor in the situation. For the last thirty or forty years the birth-rate of all white nations, with the exception of Russia, has been steadily declining ; that of Japan has steadily risen ; those of China and India can only be surmised. The white nations have learnt how to save, but also how to prevent life ; Asia has learnt neither. We are teaching the Asiatics how to prevent or minimise war, famine and pestilence, to check infanticide, to strengthen and prolong life. Under such conditions the natural increase of the coloured races will be overwhelming. Are we to wish that they too will lose the natural desire for children and learn how to check the birth-rate ? If not—since Japan at least is forewarned and forearmed, and China will not fail to profit by the experience and weakness of the white nations—we have to face in the future an expanding

force, which will intensify beyond measure the force of the yellow peril.

*Protection by Exclusion of Chinese.*—How is this real Chinese peril to be met? It is already met in one respect by the most obvious method of protection, the importation of Chinese labour being forbidden, or taxed out of serious existence, in most or all the white men's ports south and east of the Pacific. If China were to set up factories of her own in the white man's land, even free trade would hide her head, or would have no more head to hide. Great as are the benefits of free competition to the consumer, their price is too high if it is to lower the standard of living in white communities to that in China. And yet this would be the logical outcome of theoretical free trade carried into universal practice. Chinese labour working under European direction on equal terms would in time be able to undersell the produce of European labour; and it is for that reason that white labour, rather than white capital, is unanimous in excluding Chinese workmen from the shores of the Pacific, on which the white men are themselves developing industries.

*Effect on White Labour of Chinese Competition.*—But protection of white labour cannot stop there. Asiatic labour lives more cheaply, will be content with lower wages, at home than in a white man's land; and as merchants in Asia, whether white or Asiatic, find it worth their while, so will they be able to develop industries based on Asiatic labour; they

would be handicapped after a time only by the cost of freight, subject to the supply of raw material, of which there is in China an ample supply of nearly every kind awaiting exploitation. What is to prevent Chinese rails, now making their *début* on the Chinese railways, from undercutting European rails also abroad? China is abolishing the opium habit, reforming her government, her army, her currency; and as a precedent Japanese products are already competing with European in European markets. At first western capital may face the competition and be content with smaller earnings; but capital is fluid and soon finds its way to the source of high dividends—even to the Far East, if needs be, to support our successful rivals. Free competition must in time focus itself on labour and the present rivalry in armaments be replaced by rivalry in reduction of the standard of living.

*The New Bonds of Empire.*—The rapid rise of Japanese military power may then have its counterpart in commerce, in both respects to be followed by the slow but terribly sure and momentous progress of China. If this be eventually true of Asiatic labour, it must be true between all nations competing at the present day. As surely as duelling has died out or is dying out and the influences noted early in this chapter are making for peace, so surely is international rivalry becoming focussed on industry. Nay, more; the lines of Empire are being rearranged according to the channels of communication, in substitution for those of physical defence, and the navy

and army are required only for the protection of those channels, those bonds, which are becoming the real meshwork of Empire. Consanguinity is losing its force: firstly through migration, intermarriage and free communications; secondly through the materialisation of ideal, resulting from modern competition. The emigrant to Australia is at first, no doubt, in close touch and sympathy with home; but he has a hard struggle to live, and if that struggle brings him, through certain facilities, into constant relations with a German house of business, it is with Germany, not with England, that his interests will lie; correspondence, visits, education and even intermarriage will in a few generations have shifted the main sympathies of his family from England to Germany. The same must be true of a whole trade or state in proportion to the volume of its communications; and its communications will be mainly those of commerce.

*Free Competition and Social Reform.*—As suggested in the future competition of Asiatic races, so now in rivalry between the white, the burden of free competition must eventually fall on labour and its rising standard of living. But the health and strength and output of a nation depend not least on its standard of living, its food, its water-supply, its sanitation, its facilities for recreation, its skilled treatment in sickness. Health is the index of well-being; every movement for social progress involves or depends upon a rising standard of living for the masses. All these essentials of success must be cut

down under free competition. Free competition, absolute free trade, is in the end incompatible with social reform.

*The Neglected Measures of Defence.*—As against Asiatic rivalry, so in all international rivalry, protection cannot stop with mere bodily exclusion of the extremists in cheap production. We must deny to ourselves, as consumers, the benefits of sweated labour, according to our criterion of sweating, while retaining the benefits of free competition in other respects. We must officially encourage manufactured imports from markets which work under the same labour conditions as our own and discourage in proportion all imports produced by labour under worse conditions. To some extent and for the present this may be done by improvement of communications ; under shelter of naval defence and of the postal service the British Government has already made a timid step in this form of protection, following the road-making example of imperial Rome and the direct example of shipping subsidies by Germany and Japan, amongst others. Indeed it would be logical on sea as on land for the state to establish means of transit without cost. But all these measures are minor, palliative, temporary. What strikes one in the Far East, in the development of German influence, is their strategic use of every means within their power. A German Consul and a German trader with twenty years' experience in Chinese waters summed up for me the advantages of their trade in, firstly, their use of the metric

system ; secondly, their adaptability to customers' needs ; thirdly, their consular and commercial services ; fourthly, their education ; fifthly, our free advertisement of their goods as "Made in Germany" ; but lastly and above all their Bismarckian policy, as they called it, of the scientific use of a protective tariff. "Why not protect," they said, "to the extent of enabling your producers to produce what would otherwise be produced by their rivals ?"

*The Full Imperial Policy in the Interests of Progress and Peace.*—It is this deliberate strengthening of every nerve and sinew, this use and development of every sense and every nerve-cell, alike in commerce and armament, that make the mailed fist a formidable power throughout the world. It is useless for us to tinker with one detail after another ; to depend on natural development and on the supremacy or monopoly which Great Britain has long enjoyed in trade overseas. Reciprocity of one dominion with the United States ; separate commercial treaties with several countries ; the threads of the shuttle being thrown to and fro between our several dominions and foreign nations ; all tend in themselves to undermine the community of the British Empire. Now is the time to consolidate the empire, as the United States were consolidated a hundred and fifty years ago ; for the ocean is less of a barrier now than were distances of land then. The consolidation must be defensive and constitutional. But these are only the outworks ; the essential bond is

that of trade ; and, while protection of trade is essential to maintain the national health and strength as against nations of lower standard, so equally must we aim at free trade within the Empire, where a common standard for white labour is recognised and coloured labour is under control. To this end—but only as part of the whole scheme and with all the essential safeguards, limitations and adaptabilities—a scientific scheme of import duties is inevitably required, framed on the Bismarckian model and giving, in the shape of imperial preference, the power of the purse.

It is a real empire in being, not merely a nation with distant connections, that should thus hope to engage in the understanding with four other powers. It is this five-power chain that may hope to secure by further understanding with the triple alliance the future military and commercial peace of the world. It is this peace that alone can assure to the world the utmost enjoyment of its fruits without any impairment in the standard of living on which, according to western belief, the health, strength and happiness of nations must rest.

## CHAPTER XIV

### RELIGION IN THE FAR EAST

*(Read before the Christian Conference, London, 1905, and adapted)*

It was seven years ago, in June, 1904, when the Russo-Japanese War was in its fifth month, that I found myself with a fortnight in which to study conditions affecting the public health at that toll-gate of British and international commerce in the far east, Hong-Kong. It was only eighty miles, seven hours in a delightfully clean and spacious paddle-steamer, owned and officered by Britishers, up the broad but difficult Pearl River to Canton, the great commercial terminus of South China, whence and whither most of the foreign trade is conveyed in junks to or from Hong-Kong. Here, more easily than in the other main treaty ports of China, one is immediately in the midst of real Chinese life. All European business in South China centres in Hong-Kong; and the European community at Canton is therefore limited to the Shameen—a few hundred yards of river-frontage—with its gate guarded by a Chinese sentry. For the night I was hospitably entertained by a couple of young officials respectively of the British Consulate and Chinese Customs, in the old Yamen locked up in the heart of the native city. Locked up—for at six-thirty the gates of Canton are closed for the night; and we were probably the only Europeans in the midst of two million Chinese.

The experience of a night and a few hours of daylight in this Chinese London gave a first introduction to the life and problems of the Celestial Empire of superlative importance as a foundation on which to build out of subsequent glimpses and passing friendships some conception of the Chinese character, of the problems they have to face in their foreign intercourse, and of the future towards which they are tending.

My hosts were eagerly learning the Chinese language. Their instructor, a Chinese gentleman of about forty, came to them one evening in great glee, having received his commission in the imperial army. What tests, they asked, had he been called on to satisfy. He had been examined and found proficient, was his answer, in the Chinese classics, and the use of the bow and arrow. "The use of the bow!" we exclaim, "and the Chinese classics! How absurd!" But let us think again. Is it more absurd than to examine candidates for Sandhurst in Latin and Greek and to teach them the use of the sword? Sword and bow, classics of East and West, are all alike obsolete. But the test still served till recently in either hemisphere as a criterion of how a candidate had fared in the competition with others of his class, as a criterion of zeal and ability and of the education befitting, it was supposed, a gentleman. The moral to be drawn is the similarity of degree to which civilisation has reached in China and in Europe, with the definite development of the gentleman in either hemisphere, and all the complexity and subtle delicacy of feeling involved in the self-respect which is at least as marked there as here.

To one who had hitherto recognised but little the reality of Chinese literature and culture, the trip in a palankeen through the streets of Canton was of itself a revelation. In this city of 2,000,000 every street was under ten feet across and even so encroached on by stalls and bundles and goods on show, and by the striking vertical signboards inscribed with bold Chinese characters in black and gold. The open shop-fronts showed vistas of splendid black-wood furniture, silk-looms, native jewellery and massive coffins—a common feature—sandwiched in between shopfuls of Manchester cottons, German clocks and American tobaccos; but few European and only one English advertisement did I see—the substance, in other words, but not the acknowledgment of foreign influence. The busy crowds streamed along on foot, mostly in single file; and, above all other impressions, it was their faces that made the most indelible impression, active and thoughtful, alive with power and individuality, although lacking in softness or sympathy. So they bustled along, taking little notice of us; as we might bustle up Threadneedle Street, taking little notice of an organ-grinder and his monkey. An organ-grinder and his monkey—for whereas in India one feels a certain recognised superiority over the masses, here it was curious to feel that the passers-by felt as much superior to the European as the European to them, and that they looked on him not with respect, not with pity, but with evident disdain. The pride of the Chinese is not confined to the upper classes. The masses of the nation have also an intense self-respect.

For this there is good reason. Culture is widely diffused ; indeed the Chinese consider it sadly lacking in Canton and the other treaty ports. On my way from Shanghai to Japan I travelled with an American medical missionary on his way home with wife and children on furlough, after twenty years inland on the Yangtsze at Nankin. For real information about a country, commend me to doctors and missionaries. The former have an essential power of observation and sense of proportion ; both have a conspicuous love of what appears to them the truth ; both lead a life, unique amongst the foreign community, in close contact with all classes of the population. A missionary—to borrow a metaphor from worldly life—lays his “ hand ” down on the table ; he conceals nothing, and such bias as he has is perfectly honest and easily appreciated. This doctor gave a most surprising account of the extent to which China was becoming infiltrated with western literature. He had himself found it worth his while to translate Herbert Spencer’s “ First Principles,” and, as a set-off to it, Patrick Edward Dove’s “ Theory of Human Progression,” into Chinese : in a Chinese monthly magazine of or concerning English literature and history his translation was appearing in sections of Green’s “ Short History ” ; and European literature, as evidenced, for instance, by the sale of this magazine, is read to an astounding extent by the upper and middle classes, right into the interior of China, constituting a veritable renaissance. Even the remotest up-country villages have their literary societies, whose members meet to read essays and

poems of their own composition or to discuss, perhaps, or recite their classics.

But personal impressions are perhaps the strongest evidence ; and in a trip from Japan by Corea to Tien-tsin my new conception of the Chinese character was confirmed by a few days' friendship with an elderly officer of state, retiring from the Chinese Consulate at Fusan to his home near Peking. This gentleman, coming on board in the well-known blue silk dress, plaited pig-tail and stiff black cap, like a biretta, adorned with the red button indicating his rank, took his place quite naturally at table with the first-class passengers and behaved himself with such reserve and natural dignity as could not fail to attract attention. He had been for four years in the Embassy at Washington, and at our first conversation expressed regret that he had been too idle to study English. Nevertheless he spoke our language fluently, with an excellent use of idiom, and we were able to converse freely. It was surprising to find that, in talking to a person whom the common idea in Europe would class generically as a barbarian, one was talking to a man of the utmost refinement, with the feelings and courteous manners of a gentleman, the mental attitude of a high government official, the detached view and sense of responsibility of a far-sighted and trustworthy statesman. He talked frankly and with horror of the Boxer outbreak ; he admitted the blot it left on Chinese national honour in the eyes of the world ; but he pointed out its origin in the essential ignorance amongst all classes in China of anything outside the Chinese Empire.

The governing classes, too, shared this ignorance ; and it was on this ignorance that clever and unscrupulous imperial favourites, with some knowledge of the outside world, were able to play with so much effect. There were, he considered, hardly half-a-dozen officials of any standing in Peking who comprehended the reality of European power and education, beyond the obvious triumph of inventing fascinating toys and engines, such as battleships and sewing machines, a feat which ranked their inventors with the magicians. But these half-a-dozen, including such men as Yuen-shi-kai, then Governor of Chili, knew which way the wind blew, and a similar rising was impossible in the future.

This, however, is a parenthesis. The retiring Chinese Consul was a symbol to my mind of the extremely high qualities of his countrymen, material of the greatest potentialities for the work of the political craftsmen, the moulder of states. When his country arouses itself from its self-contentment, actively, instead of passively, to face European expansion, it is with equal, if not superior, intelligence and culture that the nations of the west will have to deal.

At first we find it difficult to believe that this is not an exaggerated view of the higher characteristics in a people that can be guilty of such atrocities as are a matter of common knowledge. To the traveller this is a very great difficulty ; for he touches only at the ports, he sees only the fringe, he hears only the tales of intercourse with such unrepresentative sections of the Chinese people as deal with the

foreign intruder. It was my own experience to see the prosperous state of the Chinese community imported into the Straits Settlements, primarily in order to work the tin mines ; to witness the departure of the first shipload of carefully selected coolies from Hong-Kong for South Africa ; to visit the slums of Hong-Kong, the gambling dens of San Francisco, and the workhouse, founded by Li Hung-Chang on European lines, at Tien-tsin ; and to witness the unlicensed looting of Russia-town outside Niu-chwang in Manchuria, after its evacuation by Russians and before its occupation by the Japanese, a scene that will always live in my mind as a typical picture of unbridled savagery and anarchy.

But when we think what perfect economical, political and literary self-contentment means to a people of 400,000,000, when we realise to how small a degree that self-contentment has been touched by European influence, and when, to help the current of our thoughts, we read the personal impressions of those who know the interior life of China,—Chinese, like Mr. Chiu, who have lived in Europe ; acute thinking Europeans, like the best missionaries, who have lived amongst the Chinese,—then we shall begin to realise that this estimate of the high qualities of Mr. Chiu's race is in no way exaggerated. There is merely an immense gulf of misunderstanding or lack of understanding fixed between the two types of mankind. For better or for worse, the inexorable laws of human development have decided that national seclusion shall now cease. Our aim must, therefore, be to remove this lack of

understanding and to secure gradual inter-penetration on peaceable lines. For this purpose English readers cannot do better than read Dr. Arthur Smith's entertaining and valuable books entitled "Chinese Characteristics" and "Village Life in China"; those of Mr. and Mrs. Archibald Little; the volume of essays entitled "These from the Land of Sinim," by Sir Robert Hart, whose sympathetic and statesmanlike views of these questions after fifty years' official life in the Imperial Customs is unequalled; and lastly, a little shilling pamphlet published a few years ago by Brimley Johnson and entitled "Letters from John Chinaman."

What then is the attitude of the Chinese towards Christian Missions? To answer this question, we must first briefly estimate the religious and moral standpoint of the Chinese. This is not very difficult, up to the point we require. The moral standards appear to be high and worthy of the Confucian code. Polygamy being allowed, one chief form of vice is to a large extent obviated. Indulgence in opium does not, according to the small but very good evidence given me, cause greater personal or domestic ravages in China than does alcohol with us. Great as that is, it is now steadily on the decline. Mutual help and family duty and affection are marked characteristics of a domestic life from which we may learn much; co-operation in trade-guilds is more universal; and government, if carried out with severity and some personal rapaciousness on the part of the officials, appears to be in accordance with principles understood and recognised by the people, constant, firm

and just. Official posts from the lowest to the highest are open to the common child in any village school by a complete system of examinations. The Chinaman at home appears peaceable and hard-working ; his outlook and his ambitions are confined to very modest limits ; his honesty is proverbial. It is doubtful if we in England follow the teaching of the Gospels in our common life nearly so thoroughly as the Chinese villager follows the rule of Confucius, as he has received it.

Religion, however, appears conspicuous by its absence. However closely one may inquire into the shadows of religious systems or the more obvious glitter of ancestral worship, and seek to distinguish the reasonable from the meaningless or preposterous, one cannot but conclude that the Chinaman has no conception of a personal God : has in fact no religion. In Canton the traveller is taken to these wretched temples, miserably kept up and evidently but little frequented. The buildings were not striking ; and the hall of 500 Genii, including amongst others Marco Polo with his cardinal's hat, were empty of any signs of devotion or use, except for the joss-sticks, kept fizzling in front of some of the effigies by the attendant. One temple, better maintained than the others, was a Buddhist shrine with two huge Buddhas as a centre-piece and a dozen bronze saints in niches on either side. But of public use and religion there was no sign.

Ancestral worship, it seems clear, is essentially derived from the same fear of the elements which accounts for demon-worship in Central Africa or the

polytheism of the Indian hill-tribes. In China these powers of nature are in no way correlated to the creation of the universe, but to the action of departed spirits. And it is in fear of these departed spirits that the people offer food, money and clothes to help the dead in the other world, and prevent their taking vengeance on their neglectful living descendants. Amongst the uneducated classes this amounts to a fear and a superstition ; amongst the educated it implies a considerable ritual, hallowed by domestic memories and accumulated custom, the centre of their domestic and so of their national life. Argument is powerless to overcome it. Habit is stronger than reason.

Here then is the nucleus of Chinese feeling towards the missionary. For the missionary, by Chinese belief, is *primâ facie* a foreign devil, possessed by a destitute spirit, in search of vengeance for neglect by his descendants. Hence, if plague or famine break out in a place where a foreigner resides, it is the foreign devil that has caused it and must be driven away or, better still, exterminated so as no longer to afford refuge for the spirit. This natural public feeling may obviously be inflamed by injudicious propagandism or protection of evil characters, by lack of education or sympathy on the part of the foreigner ; but it may on the other hand be mitigated by kindness and self-devotion, as medical missionaries have especially found. One, already quoted in this paper, habitually travelled alone up to a hundred miles from Nankin without fear. He spoke so soberly as to give confidence in his assertion

that the missionaries are seldom the cause of riot in China, but are often the victims of a general riot against white men, promoted by the drastic and often totally unprincipled action of traders, or militarists like the Germans in Kiaochao, or the Roman Catholic priests, bidden by papal order to assume Mandarin rank as a Chinaman might come to England (if he makes haste) and claim a seat in the House of Lords ! Indeed, in the late Boxer troubles, started primarily in a movement against an Italian trading company in Shantung, the local missionaries were spared by being able, after much trouble, to prove that they belonged to the mission.

Is ancestor-worship, then, merely a system of reverence for the dead ? Surely not. The Jesuits, indeed, in 1610, under Ricci, shortly after their arrival in China in 1582, tolerated it ; the Dominicans in 1651 forbade it. Emperor Kang Hyi, appealed to by the Jesuits in 1699, replied : " The customs of China are political " ; but Pope Clement XI. in 1704 issued a papal bull, which still holds good, forbidding it. Four hundred Protestant missionaries in conference in Shanghai in 1900 discussed the plea of Dr. Martin, President of the Chinese College at Peking, for toleration of the custom, wishing to " leave reformation of the system to the influence of divine truth " ; but the proposal was rejected, the conference deciding that idolatry was an essential constituent of the custom. Here we must leave it, convinced in our belief that religion, in our sense of the word, has no part in Chinese life or thought.

This chapter has dealt at length with the Chinese

character, for this is the extreme point from which all conclusions as to the relationship of Confucianism, Buddhism and Christianity in the far east should start. The essential Japanese mind and life, as born into the life of the world by the overthrow of the Shoguns in 1868, are deducible, though very different, from the Chinese in the present day. Indeed, if we eliminate the influences of the last forty years, all that Japan is or has is derived from China. Buddhism came over from China, and asserts itself in symbols of art and letters even on the archways—*torii*—of the Buddhist temples. The characters of writing are Chinese; the abacus, or calculator in use in every shop and school, came from China; food and customs, as of ancestor-worship, forms of government and methods of war, art in painting, embroidery and architecture came across from the mainland, following indeed the Japanese themselves. But the Chinese, it is said, are the Germans of the far east; the Japanese are the French. The rich, heavy, detailed embroidery, the ponderous brass-work, the solid black-wood furniture, so highly appreciated by the European community at Shanghai, are but the forerunners of the delicate, gauzy silks, with large flowing designs, the natural lifelike bronzes, the light lacquer work of Japan. Japan adopts the material and the conventions of China; but instils into them a wealth of versatile feeling, giving them a new life, in keeping with her marvellous life-giving spirit. China is essentially the thoughtful originator. Japan is seldom the originator; she is the adapter. As in her inter-

course with China, so in her history of the last forty years, Japan has invented little ; but she has been quick to seize on all that is best in every domain of European civilisation, to adapt it to her own ends, and gradually to develop it to suit her own purposes. The medical schools, for instance, at Tokyo and the half-dozen naval and military hospitals throughout the country, showed an almost slavish imitation of the German methods in which Drs. Baelz, Scriba, von Scheube and post-graduate study in Germany have instructed the Japanese doctors of to-day. These methods were but adapted to the scanty financial circumstances and the climate and the commonly available materials of Japan. But it will not be long before this adaptation in the light of active experience will produce new developments of intrinsic value. Japan is not an originator ; but she is a remarkably good adapter.

Now in Japan there is considerable sign of the presence of active religious feeling. Not in the artistic wonders of the tombs of the Shoguns at Tokyo, nor in those of the temples at Nikko and Kyoto ; for of itself the art does not prove the existence of the religious sense. But it was the new temple at Kyoto, the Higashi Hongwanji, which was most impressive as a sign of active religion (Plate 15). The temple itself was erected only during the last twenty years by small popular subscriptions amounting to £100,000 in all, in the place of its historic predecessor, burnt down. Entering into the great nave, one morning, and sitting down on the padded matting in a corner, one was first impressed by the

A MODERN BUDDHIST CATHEDRAL IN JAPAN.



(a) The Higashi Hongwanji, Kyoto, built in 1895.  
(b) The Interior: the Congregation and the Image displayed.



sense of restful beauty, of grandeur and of repose, both in the broad outlines of construction and in the details of lacquer work and ornament ; but the effect was still more impressive of seeing a devout congregation of a hundred or so Japanese following a service, strangely like that of the Roman Church. From behind a barrier, separating nave from chancel, came sounds of some sacred reading in clear and definite tone ; after this was finished a priest in fine robes advanced as it were to the altar ; in absolute silence a bell was tinkled, and reverently the shrine was opened, displaying the image of Buddha. All bowed prostrate to the ground, and remained so, it appeared, in silent prayer, for one or two minutes. The bell again tinkled ; the doors of the shrine were closed, and the people rose to leave the temple.

It is difficult to say how much the Japanese feel the profounder problems of the universe and the need of a personal God. From the few learned and good Japanese with whom I had an opportunity of free conversation, it would seem that these matters are of no interest to the enlightened classes. And it will be realised that throughout the Japanese Empire elementary education is in an advanced state ; and in the towns, the halfpenny papers have a wide vogue, even amongst rickshaw men and labourers, so that what affects the upper, affects also the lower classes. Religion would seem as yet in general to have rather a practical than a sentimental or theoretical interest for them. But is this surprising ? Is it not natural that, in encountering

the civilisation of the west, they have first to establish their material strength with a view to the survival of the fittest among nations ; that they should be first struck with the wonders of science and manufacture, and should direct all their energies to the establishment first of their military and then of their commercial position in the eastern seas ? For the present, therefore, it can be well understood that they are content to look for all that contributes outwardly to make a nation great ; while, for their credit in the eyes of the civilised world, they are developing a more humane regard for weakness—in their care of women and children, their treatment of the sick and wounded, of prisoners and criminals and animals—have adopted certain conventionalities, such as the top-hat, black coat and starched collar for official circumstances, to facilitate their treatment by other nations on terms of equality ; have constructed an enlightened judicial code ; and are laboriously studying every form of knowledge and experience in Europe and North America.

It is a quaint but somewhat mortifying fact that not long ago a commission of Japanese students, sent over to study European methods and manners, reported the total severance of Christianity from modern progress and modern European life. It was on this report that it was decided not to proclaim Christianity the established faith of Japan. For this result Christians may be thankful ; but it reads them a very obvious lesson. It is possible for Europeans, nurtured in the Christian faith, to learn the meaning of religion, quite apart from the

form—the words—in which the religion is expressed. These words, these forms, were drawn up many centuries ago. In common use the words and phrases have often acquired a different meaning to accord with modern scientific developments ; but their religious use remains the same. In the spirit in which our immutable religion was revealed to the early Jewish and Christian churches, we still believe in the resurrection of the body, we still read with profit the first chapter of Genesis. But the Japanese examine such documents with the critical standards of modern scientific nomenclature ; and do not, perhaps, realise that the exact order of creation, the exact chemical significance of the risen body, are of minor importance, and were never part of the revealed religion to which alone we subscribe.

Here, then, is the essential difficulty the missionaries have to face—in China, as in Japan, though at different stages of development. The missionaries deserve the utmost honour and support. With few exceptions, they are whole-hearted and zealous, even to martyrdom ; and they stand to the credit of the white races as the sole evidence that commerce, Empire and selfish aggrandisement are not the essence of their strength or the end of their aim. It is for that reason that missionaries, however little they may desire it, should be protected to the utmost of our national power by our official representatives ; for an insult to a missionary is an insult to his race, not to his faith ; and if we do not officially protect him, we lend colour to the suggestion that our public

aims are purely commercial, militant and selfish. The missionaries, however, do not as a rule make out the best case for the Christian faith. Too often they and their supporters at home cling to the letter, when the spirit alone giveth life. Acknowledging as they do the power of the Spirit, they cannot allow the absolute unimportance of the phrases in which it is cloaked. And so their gospel is concealed by what to us is a true, but to the Asiatic an entirely false, mantle of dogmatic creed.

Let us go further. Is it essential to Christianity that it should be based on Old Testament history? This is the way in which it has been brought to us; but is it essential for the Asiatics, to whom the Jews are of no importance and for whom they have no interest? May it be asked, humbly and reverently, Had Our Lord been born in China or in Japan, would He have begun His mission by preaching Jewish tradition and history? Would He not have taken as His foundation all that is so noble and inspiring in the doctrines of Confucius and grafted on that His glorious revelation of the eternal purposes of God?

I venture to suggest that from that and from no other direction of investigation on the part of Chinese and Japanese scholars and patriots can any considerable spread of the Christian Church be possibly expected in China or Japan. There can be no doubt that the six English and American bishops of the "Church of Japan" will be succeeded by Japanese; that the result of the recent war, as one of these bishops confessed, will undoubtedly tend towards

the independence of this Japanese Church, so soon as it can be assured of financial stability, and that any such Church, unless securely built into the rock of Japanese tradition and virtue, will have to choose, on the one hand, between the formal doctrines of western Christianity, as we have learned it, involving complete alienation from the life of the Japanese people, and, on the other hand, such startling developments as may lead to schism within and separation from other branches of the Catholic Church without. The possibilities of Christianity are well shown in Tokyo by the wonderful labours of the late Russian Bishop Nicolai, who by his own magnetic influence attracted 120,000 converts, so it was said, to the Greek Church. It is for us to see that those at home and those sent out as missionaries to the Far East should be of the highest intellectual culture possible, men of broad sympathy, high statesman-like ability, and, it is needless to add, of glowing faith and fervent zeal. Scholars from home are wanted to interpret to the eastern the essential basis of the Christian faith, in terms which they will understand, in accordance with the life and history which is part of themselves. The basis of their work must be some such presentment of modern faith, if a filial tribute may be permitted, as that by the Dean of Ripon in his little book entitled "Natural Christianity." This is all that the west can do. The seed must then be allowed to grow; for it is to Japanese and Chinese teachers and preachers, to some Japanese or Chinese prophet that shall arise, that the eventual development of a religious system

must be left ; it is they that must evangelise the mighty nations of Japan and China ; and it is He, who hath begun a good work in our western lands, that will in His own time and in His own way continue it in the countries we so little understand in the Far East.

## CHAPTER XV

### HEALTH-FAKING AT SAN FRANCISCO

THE serious effect of epidemic disease upon commerce to which attention has constantly been drawn in the preceding chapters is nowhere more strikingly shown than in the extraordinary action of the municipal officials at San Francisco in the first few years of this century. The story on the one hand points to the need of medical advice, and of due attention to that advice, in the administration of public health ; on the other to the financial value of health measures and to the consequent miscarriage of justice that may deliberately be effected by local officials, even of a large city, when not properly supervised or controlled by the central authority.

Plague broke out in San Francisco in the year 1900, and it is not difficult to trace the steps by which the dreaded epidemic thus reached the United States. Extensive traffic between Japan on the one hand and Formosa, Hong-Kong and other Chinese ports on the other, is sufficient to account for the small footing which plague obtained in Japan during the course of the epidemic. In 1894, 1 case was recorded as imported to Japan ; in 1896, 1897 and 1898 the disease was imported three times in each year ; and in 1899 six times. In December 1899 elaborate

and most effective regulations were issued for the management of plague at Kobé, the great central port of Japan, Osaka, the chief manufacturing centre, close by, and other districts that might be subsequently invaded by plague. Up to the 22nd December 23 cases and 19 deaths had been recorded at Kobé; but Professors Kitasato and Ogata were of the opinion that plague was the cause of death in most of 270 cases which had occurred in September and October 1899 from acute pneumonia—a disease not at all common, it is said, in Japan—in 230 deaths attributed to acute meningitis; and in 266 deaths attributed to beri-beri. Kobé, be it noticed, has a population of about 230,000.

At a meeting of the Central Sanitary Association at Tokyo it was concluded that the disease was probably brought to Japan from Hong-Kong or Formosa. By the reward of a penny for every rat brought to the authorities in Osaka and Kobé, 3,050,000 rats were killed in the eighteen months up to April 1901. In Osaka about one-tenth, and in Kobé as many as one-fifth, of these were found by bacteriological experts to be suffering from the disease. In this and other ways the disease has been kept in check, the maximum number of reported cases in Japan in any one year being 646, and the total number for thirteen years, to the end of 1909, under 2500.

The epidemic was now spreading to the Sandwich or Hawaiian Islands, the half-way house of most of the trade routes between Eastern Asia and the United States. On 18th June, 1899, the steamer, *Nippon Maru*, from Hong-Kong and Japan for America,

landed a body which was found to have died from plague. A few other cases were also found on ships calling at Honolulu, but it was not till November that the local authorities began to realise that the infection had in reality gained a footing in the islands. The earliest cases were recognised by a Chinese doctor early in November, corroborated after *post-mortem* examination by Dr. Hoffman, bacteriologist of the Hawaiian board of health, and confirmed by bacteriological investigation and by experiments on animals. On 12th December, 1899, the board of health officially declared plague to have broken out at Honolulu.

The amount of trade passing between the Sandwich Islands, now part of the United States, and San Francisco, is very considerable, and on 6th March, 1900, the dead body of a Chinaman was removed from the Globe Hotel, in the Chinese quarter, death being found, by bacteriological and inoculation experiments, to have resulted from plague. The deceased Chinaman had resided in San Francisco for fifteen years. Two days later six suspected cases came under observation in "Chinatown," and immediately the local board of health instituted a general inspection of the Chinese quarter, with scavenging of all premises. The Chinese consul and other influential Chinese residents in San Francisco undertook to see proper precautions carried out; but by 19th March fresh cases began to be heard of in different parts of the Chinese quarter, and in one of the fatal instances *post-mortem* examination, followed by bacteriological investigation, proved the death to have been due to plague. It was evident to the authorities that the

Chinese population were concealing cases in order to escape inspection of their houses and removal of their sick to the hospital.

On 19th May the local board of health officially declared the existence of plague at San Francisco. Further house-to-house inspections were ordered, but this measure was frustrated in a large degree by the Asiatics keeping their houses barred and declining to admit the inspectors. Railway and transport companies were ordered to refuse tickets to Chinese and Japanese unless they possessed certificates granted by the health authorities. Inoculation by Haffkine's prophylactic was freely offered, but little use was made of it by the public. It is said that a Chinese secret society, known as the "High Binders," threatened to assassinate all Chinamen in San Francisco who submitted to the process. The Japanese, on the other hand, largely submitted themselves to inoculation. Reports were circulated of Chinamen being made very ill and dying from the effects of inoculation, and this helped to keep the Chinese from coming forward to submit to the operation; but inoculation was insisted upon when Chinese residents wished to travel from San Francisco.

The state of affairs now reached headquarters at Washington, and a number of medical officers of the marine hospital service were despatched to San Francisco, to take part in railway and road inspection, and to assist in carrying out the preventive measures. Further inter-state quarantine regulations were added to those already existing in May, 1890. The matter was clearly one of national importance to the

whole of the United States. From 6th March to the end of the year 1900, 22 cases, all fatal, were officially reported; 10 were verified by *post-mortem* and bacteriological examination. None of these ten cases came under the observation of the health authorities during life. All were Chinese and had lived in the Chinese quarter. In his annual report to Congress for 1901 the secretary of the treasury reported as follows :—

“ The existence of bubonic plague in San Francisco, which was first reported on March 8th, 1900, and of which mention was made in the last annual report, was confirmed by a commission appointed by the department, consisting of three bacteriologists of the highest reputation, who had had no previous connection with government service. This Commission reached San Francisco in February, 1901, and after an exhaustive investigation rendered a report so conclusive in its nature as to result in measures being taken to cleanse Chinatown, where the plague existed.”

It was inconvenient, however, to the reputation and commercial welfare of San Francisco that plague should exist, or be even suspected to exist, within the city. Neglecting the advice of their board of health, the local authorities declared that it did not exist. Notwithstanding the fact that the disease had been proved, by *post-mortem* examinations, by bacteriological investigation, and by experiments on animals, to have existed in the bodies of the dead Chinese, the governor, as reported publicly in *The San Francisco Chronicle* of 14th June, 1900, convened a meeting of the leading commercial men of the city, at which a strongly worded protest was drawn up and sent to the secretary of state, denying the exist-

ence of plague, either then or previously. Some medical men of no great repute, but connected with the local authorities, signed this protest, giving only vague reasons for their dissent from the declaration of the board of health. No case, they said, had been diagnosed as plague during life ; only 11 deaths had occurred, as they put it, in a Chinese population of 35,000 ; there were no cases amongst whites ; investigation of the supposed plague cases had been incomplete ; the recorded mortality from all causes had not risen ; there was no proof that the so-called plague had been transmitted from one person to another ; there had been no multiple cases in families—in other words, they sheltered themselves under the fact that the Chinese had done their utmost to defeat the law, and the authorities to obstruct the investigation of the disease by their own board of health. Finally, the allegation that plague existed in San Francisco was characterised by the governor as an aspersion upon the character of that “ great and healthful city,” and it degraded San Francisco in the eyes of the whole world. It is asserted that at a later stage the governor of San Francisco, in a message to the legislature alleged that

“ certain physicians, having cultures of plague bacilli in their possession, have, innocently or otherwise, inoculated the dead body of a Chinaman with them, and that the finding of the germs in such dead body has resulted in spreading a false alarm calculated to strengthen the hands of Dr. Kinyoun, the federal quarantine officer, and to induce the City of San Francisco to appropriate more money for its board of health.”

The action now taken by the mayor of San Fran-

cisco is hardly credible. On 25th March, 1902, without previous warning of his intention, an order was issued from his office, peremptorily removing those members of the board of health who were appointed by his predecessor, and substituting in their place certain persons of his own selection. Each member of the board received a letter of dismissal, giving reasons for this action, but these letters were received only after the newly appointed board had effected an artificial organisation. The reason for this action was said to be based upon the thorough investigation which the mayor said he had conducted into the case.

The original board, however, with pluck and independence worthy of the race, refused to be deposed, and on the following day made application for an injunction restraining the mayor, his attorney, and all other persons from interfering with the members of the board or their employees in discharging their official duties, and prohibiting his Honour from intruding into the rooms or offices of the board. The injunction was granted by the presiding judge of the superior court, and the mayor brought a motion for its dismissal, which was decided on 19th May. It was ruled that the old board maintained possession of their offices until definitely ousted in the course of legal proceedings by a writ of *quo warranto*. Such proceedings were accordingly instituted by a clerk in the mayor's office on 27th May, 1902, but it had not yet come up for final hearing before the board of health which refused to be deposed issued on 30th June its annual report for the year 1901, a bulky

volume of five hundred pages, with a long prefatory letter, teeming with capitals and italics, which must be quite unique in documents of this description.

“To the Honourable Eugene E. Schmitz [it began], Mayor of the City and County of San Francisco. Sir: The Department of Public Health of the City and County of San Francisco has the honour to present for your consideration its Annual Report for the fiscal year terminating on this date.”

The report was a sweeping condemnation to his face of the mayor's extraordinary action, no attempt being made to conceal the motives which were supposed to have promoted his action. The authors regretted the absence of proper maps and charts, owing to his Honour, despite funds having been provided by the finance committee of the board of supervisors, having declined to approve of the expenditure. A daily newspaper published in the city was quoted as reporting the mayor to have accused the board of health of incompetence for not issuing reports for the two preceding fiscal years. It was shown that the budgets of those fiscal years did not provide for the printing of such reports. With remarkable candour, the report declared that

“careful examination of the information contained in this Report will indicate *to one who is willing to be instructed* the character and amount of work being accomplished under the direction of this Board, and will further serve to demonstrate that the Department of Public Health is conducted for purposes *other than the protection of political pets and the extravagant and unnecessary expenditure of municipal funds*. During the past year much official business has been transacted. . . . All dealings have been conducted without serious differences; and at present writing

this Department appears to exist in harmony with all branches of the Municipality except the Mayor's office."

The history already narrated, as to the relations between the mayor and the board of health, were now set forth in detail, with much plainness of speech. As to the thorough investigation said to have been conducted by his Honour,

"it would appear as if said 'investigation' were either visionary or entirely *ex parte*. It will be remembered that shortly after the induction of Your Honour into office the members of this Board called to present their official respects, and at that time, in response to a request to visit and inspect the operations of this Department, Your Honour stated that such was your intention. . . . There is no evidence, however, that Your Honour has ever visited the Health Office since assuming the duties of Mayor, except in one individual instance, when, supported by Your Honour's attorney and accompanied by the gentlemen comprising the so-called new Board of Health, and a staff of newspaper representatives, you invaded the rooms of the Department for the purpose of taking possession thereof, and installing in office the said so-called new Board of Health. There is no evidence to show that Your Honour ever asked any member of the Board of Health, or any responsible officer connected therewith, any question whatever regarding the existence of bubonic plague in San Francisco, nor does it appear that Your Honour has ever sought to examine the records in the Health Office for such facts as might be presented on the subject, except on one occasion, when you asked for a transcript of the report in a case of plague, which was discovered by Federal officers, and by them reported to this Department. Notwithstanding the failure or neglect on the part of Your Honour to have submitted, for use in your investigation, the records on file in this office, you assigned as a reason for the dismissal of this Board the following:—'It is evident from recent instances and developments,—one as late as February 21st, 1902,—that you are absolutely and unchangeably committed to the policy of main-

taining, harbouring, and proclaiming this baseless bubonic plague agitation, that you are proceeding even at this late date upon the theory that every case investigated is a suspicious case, and that every such case must be assumed to be and published as a true case of bubonic plague until the contrary is so clearly established by overwhelming evidence that the true disease can no longer be concealed under the mask of the bubonic plague. This policy is one of irreparable injury to the people whose protectors you are supposed to be, it is against the welfare and prosperity of the city, and is in my opinion ample and abundant justification for your removal. . . . For three months past I have carefully examined and investigated all accessible reports and records, and have personally enquired into numerous specific cases reported and declared by you, and under your authority, to have been cases of bubonic plague, and I am unalterably convinced that, notwithstanding your investigation and publications, bubonic plague has not existed and does not exist in San Francisco.' "

It is a mistake that officials should give a reason to their inferiors for their action, and the late mayor of San Francisco will meet with little sympathy in the pillory to which he is thus subjected. Having expressed the resentment of the board at "the diaphanous courtesy of an expressed regret" with which the letter of dismissal ended, the report went on to enumerate the steps they had taken to enlighten the public as to the actual conditions.

The facts of the existence of the plague are set forth with brutal frankness :—

"If Your Honour will consult the last two Annual Reports issued by this Department, a brief statement will be found in each."

"Notwithstanding Your Honour's assertion that you have carefully examined and investigated all accessible reports and records relating to plague, you are again reminded that the reports

and records on file in the Health Office, as well as those in possession of the Marine Hospital Service, have not as yet been consulted by you."

"In summing up the result of Your Honour's investigation, you have neglected to mention the Report of the Federal Commission on this subject, which was issued as an Official Bulletin by the United States Treasury Department, and has been accepted as an authoritative opinion by all who possess sufficient intelligence to appreciate the standing of the members of the Commission and the character of the investigation conducted by them. Your Honour has also omitted to note the reports of medical men from Honolulu on file in the Health Office, or the report of the Health Officer of British Columbia, who spent several weeks in San Francisco conducting an investigation."

"Your Honour has also failed to make reference to the report of Dr. H. L. Ryfkogel, of this city, formerly Bacteriologist of the State Board of Health, whose report was suppressed by the Board under which he served, and who was deposed from his position by order of the Governor, and was further refused payment for the services he performed, all of which occurred because he had found plague, and had sufficient courage to declare it in spite of the Executive displeasure."

### The Board of Health next proceeds to pillory the

"Report of the Special Health Commissioners appointed by the Governor to confer with the Federal authorities at Washington respecting the alleged existence of bubonic plague in California ; also Report of State Board of Health. The purpose of this Report is palpably one of deception. Its contents add nothing whatever to scientific information, and its conclusions contribute still less to veracity. . . . It scarcely seems reasonable that a Commission made up of editors, an attorney, and a manufacturer, no matter how distinguished, should possess the scientific qualifications which render their judgment in matters appertaining to any disease, and particularly plague, superior to that of a Commission consisting of the leading bacteriologists of the United States, such as was the confidential Commission appointed by the Honourable Secretary

of the Treasury, with the approval of President William McKinley. . . . Little need be said about the professional evidence secured by the Special Health Commission and the State Board of Health. It may be true that the influence of the Commission has been potent in producing the testimony of medical men subversive of truth and in contempt of medical ethics. It may be also true that there are physicians in public office who are sufficiently pliable to forget at will the duties of their calling, and bow their heads in response to the dictum of a political power. It may likewise be true that, when gifts of lucrative appointment or military title are held forth as inducements to depart from paths of professional rectitude, the bait is too alluring to meet with resistance on the part of some who yearn for the trappings of gilded pomp, or crave for a little brief authority."

In the last page of their preface, this defiant—if it were not for the justice of their cause one would say insolent—Board of Health come to business.

"The Board of Health now announce to you that since March 6th, 1900, fifty-seven cases of bubonic plague have been observed by this Department, twenty-three of which have occurred during the fiscal year ending this date. The discussion of plague in this report is now closed.

"The prospects of satisfactory work under direction of this Board, for the coming fiscal year, appear favourable. The Board of Supervisors has made liberal allowance in the Budget for this Department in all its branches. The members of this Board regret exceedingly that Your Honour saw fit to exercise the veto power upon so many of the very important items provided for this Department in the annual Appropriation, but we view with satisfaction and pleasure the recent action of the Board of Supervisors in permitting the Budget to remain un mutilated. We feel confident that, had Your Honour possessed a more intimate acquaintance with the actual work of the Department of Public Health, and had not listened so willingly to its detractors, your veto might not have been applied so freely."

The Board are able to devote one short paragraph to the congratulation of his Honour on his action which resulted in the provision of a special tax for the erection and maintenance of a new City and County Hospital. They conclude by declaring with biting sarcasm :

" It is difficult to determine whether membership on the Board of Health of this City and County is to be looked upon as a crime or as a joke. If it be the latter, the sooner the Charter is amended, so as to permit of the appointment of editors and professional politicians to such membership, the sooner will the city be safeguarded from the dangers which threaten it through the mis-directed efforts of medical men, who persistently decline to have their opinions manufactured to order. If it be a crime, information should be filed with the Grand Jury, which will tend to bring about the indictment of the criminals and their subsequent obliteration from the official community.

*" Respectfully submitted :*

*" (Signed) JOHN M. WILLIAMSON, M.D.,*

*" President, Board of Health."*

Many persons used to official work in this country will read with growing impatience the disdain and disrespect for authority shown, and, indeed, insisted on, in these paragraphs. But it must be remembered that the writers of those paragraphs were fighting with the mayor to whom they made that report, not only for their own existence as a board, but far more for the welfare and safety of San Francisco, and for the deliverance not only of their fellow-citizens, but of California and the whole of the United States, from that terrible danger which in India has cost us 7,000,000 lives, and may, for all we know, work fearful ravages if ever it be allowed to gain a foothold

in a white population. No honeyed words or official courtesy would sufficiently express their sense of the grave injury which might result through the action of the local authorities ; the blind eye, they were determined, should no longer be turned towards the unmistakable facts of the case. It was war to the knife, but, if they should perish in the attempt, they would anyhow have done their best to save their city, their state and their country from a terrible danger.

Fortunately they did not have to fight their battle alone. A special commission, as I have already said, was sent from Washington, and, in accordance with an agreement between the federal department, the authorities of the state of California and the city of San Francisco, the work of inspection, isolation and disinfection in Chinatown, San Francisco, was carried on by a corps of physicians and employés of the state and city, under the advice and direction of a surgeon and a corps of assistants of the marine hospital service. The work was completed on 21st June, 1901, at which time, 1180 houses, containing 14,117 rooms had been disinfected, the burden of expense falling upon the local and state authorities, the federal treasury paying only the salaries and incidental expenses of its own officers. This work being completed, a skeleton-organisation was maintained for the purpose of making examinations of the sick and dead in Chinatown and assisting, when requested, in the disinfection of premises where cases were found. From the beginning of the outbreak to the end of 1901 over 50 cases were found.

On the occasion of my visit to San Francisco in



SAN FRANCISCO.



(a) Outwardly: In Market Street.

(b) Inwardly: Where Plague broke out, in the Old Globe Hotel, Chinatown, and the Federal Service was now giving it a thorough clear-out.

September, 1904, the laboratory of the marine hospital service, the federal institution with headquarters at Washington, was in full swing and Dr. Blue and two others engaged in the work of stamping out plague took me round Chinatown to see the measures they were conducting for the purpose. Their tact evidently had taken effect. We were admitted in and out of barred opium dens, in which, previous to their arrival, it would have been easy to hide cases of plague.

"Dens" is an appropriate name for these squalid hovels. Doors and windows were made fast and windows covered; there was little or no ventilation for lamp, fire, or opium smoke; and only the smallest shaft of light, if any, came down a chimney-like opening at the back of the diminutive premises. We were only admitted after being inspected, as at the door of a convent, through a little window looking into the dark passage by which we approached the door, so that the inhabitants might convince themselves that we were not police. The police, however, very seldom raided the opium dens and the fantan or gambling-houses, as the Chinese born in the country (and others are not now admitted) have votes, on which the judges and officials depend for political support. We went down to the basement of the old Globe Hotel, where the plague first broke out in 1900, a fifth-rate eating-shop on the edge of the Chinese quarter (Plate 16). The plaster was down from the walls and ceilings, and the basement was being cemented, the uncemented part standing an inch deep in water. It was easy to imagine

the conditions which fostered the outbreak of plague.

Dr. Blue and his staff in 1904 believed in soil infection as the chief agent, independent of rats, and the measures on which they therefore depended were the cementing of basement floors and the occasional pulling down of insanitary buildings. It was a pity that—no doubt for good official reason—through-ventilation was not aimed at, even in new or renewed houses. Building seemed to be taking place on any and no principle; but my friends had undoubtedly made one most useful step in advance in gradually insisting on concreted basements in all houses of those miserable slums. From February—that is, for over six months—the city had, so far as they were able to tell, been entirely free from plague.

It is well to know that the danger of plague securing a foothold in San Francisco was recognised by other states as one of more than merely local importance. The concealment of plague by the officials at San Francisco excited lively indignation in other state boards of health, and this feeling found expression in their motions and minutes. As an example may be taken the report of a committee to which the matter was referred by the state board of health of Iowa. They were

“forced to believe that facts pertaining to the true and exact conditions then existing were purposely and unwisely withheld from health boards and sanitary authorities, directly interested, by the officials of the state of California and by the marine hospital service for commercial reasons and against the best interests of the people of all the states.”

### They protested

"against this policy of suppressing facts, and putting the commercial interests of any state or community above that of public health."

Whatever the exact result of the proceedings between Mayor Schmitz and the board of health he had sought summarily to dismiss may have been, the fact remains that the report of the department of public health in 1904, a couple of months previous to my visit to San Francisco, was signed by a new president, James W. Ward, and contained no mention of the plague. It stated that, from 30th June 1903, for six months, the chairman of the board of health was a layman who submitted no report to the board as to the service during the first half of the fiscal year.

Since then, the commissioners constituting the new board of health had sought to fulfil a policy of general upbuilding of the department. Through the unstinted efforts of Dr. W. C. Hassler, the chief of the sanitary bureau, insanitary conditions through the city, especially in the Chinese district, were being actively corrected. An ordinance had been proposed to compel property-owners to make their basements and cellars rat-proof. The basements and cellars of four large blocks, containing 125 buildings, had thus been condemned, deprived of their wood floors, partitions and ceilings, and concreted. The crusade against the general insanitary condition of Chinatown had been most energetically followed. From a place of filthy accumulations and

infectious odours it had become one of comparative and habitable cleanliness. It was proposed to buy a portable steriliser, to assist in the disinfection of certain contents of premises that would otherwise require destruction, and to insist on the disinfection and stamping as disinfected of all fabric merchandise exported from Chinese quarters. The co-operation between the United States public health and marine hospital service, the state board of health and the commission for public health of the city and county of San Francisco had resulted in the organisation of a "Public Health Commission of California," with past-assistant surgeon Dr. R. Blue as its president, in order by monthly meetings to promote interchange of ideas and to enable the members to look at public health from a wider standpoint than would otherwise be possible to them.

The story of the graft-conspiracy in California and its eventual defeat reads like a criminal romance of the most fantastic kind. It was well told in *The Times* of 23rd January, 1907, and 1st and 2nd January, 1908, and there is no room to repeat it here. But readers of this chapter will want to know the background and the sequel of the incident here related.

It was due to a grant by the legislative of a well-meant but ignorant charter in 1898 that the hitherto good administration of San Francisco was put under the absolute control of the popularly-elected mayor. In 1901 an extremely able and unscrupulous French Jew, named Abraham Ruef, secured by a small majority through the support of the powerful labour-unions the election to the mayoralty of Eugen Schmitz,

with himself as his recognised adviser. Schmitz at the time, having failed in various business enterprises, was president of the musicians' union and leader of a theatre orchestra at a salary of £8 per week. By labour-union votes he was re-elected to the mayoralty in 1903 and 1905. The earthquake and fire occurred soon after the election of 1905, and formed an opportunity for extending on a vast scale the system of blackmail and corruption which Schmitz and Ruef had been gradually constructing. By the end of 1905 the most powerful system of "graft" ever evolved was in full operation, and the proceeds must have run into six or seven figures sterling.

The salvation of San Francisco was wrought by four men: Mr. Rudolph Spreckels, millionaire; Mr. Francis J. Heney, federal district attorney; Mr. Fremont Older, editor of *The San Francisco Bulletin*; and Mr. William J. Burns, a secret-service detective in federal employ. The story of corruption that they revealed was incredible, and the difficulty of gaining a fair trial and of securing evidence was immense.

Finally, however, on 8th July, 1907, Judge Dunne sentenced the ex-mayor to prison, and added: "You will suffer the humiliation of knowing that your career of hypocrisy, duplicity, and dishonour has been exposed, and that you stand before those who believed in and honoured you morally naked, shamed and disgraced."

To a group of newspaper men around him Schmitz announced that he would again be candidate for the office of mayor in the following autumn.

Ruef also was subsequently condemned, but was liberated on enormous bail; Schmitz, on release in 1908, gloried in having spent a term in gaol, giving a banquet to the embezzlers and other criminals who were in prison with him.

But the power of recovery in such a community is astonishing. The loss of property from the fire is reckoned at over £70,000,000; but the total assessed value of all buildings in the city exceeds to-day by £4,000,000 sterling that of the buildings assessed before the fire in 1905. Thirty-five million pounds have been spent in building since the fire, and in spite of the "graft" scandals, in spite of the fire, in spite of the recent financial depression in the United States, the loss has been made good.

It is evident that the stand made by the best medical men in San Francisco against the deliberate burking of evidence and shameful neglect of their duty on the part of the local administrative authorities had as its result the stamping out of plague from the western door of the United States. In this reflection, apart from other considerations, the members of the health board will feel well rewarded. The subsequent condemnation and imprisonment of the mayor and his accomplices in these astonishing "graft-scandals" will have been far less gratifying to them than the purification of municipal affairs under a sterling representative of their own profession in Dr. Edward Robeson Taylor. In a progressive community of motley complexion, devoid of tradition and independent of the outer world, the qualities required of an administrator are pre-eminently those

required of the medical man, as attributed to the ideal physician in daily life by Robert Louis Stevenson. Stevenson's memory in San Francisco is aptly preserved by a little Spanish galleon, standing on a granite pedestal in Portsmouth Square, with sails bellying out before the wind, filled with the breezy vigour of his man-compelling books. How his spirit must have revelled in the triumph of the health-board over the product of corrupt democracy !

Prig-like, we may be inclined to give thanks that our municipal life is incapable of such corruption. But it is a fact to which every medical officer even in this country will testify that, time and again, youthful enthusiasm and mature and wise counsel for the public good are alike suppressed in municipal service by a slovenly or slothful, timorous or pig-headed refusal to budge from precedent, to listen to new ideas, to risk on an experiment the life of a dog or the health of one individual, where the health and happiness of thousands are yearly sacrificed by preventable causes. Evil is just as prevalent under the smooth-faced, press-flattered democracy of to-day as under many a mediæval tyranny ; just as hateful in the enlightened and wealthy corporations of the old world as in the wild-oat-sowing, hustling municipalities of the new. The public standards differ ; the contrasts over there are more marked ; nothing can escape advertisement. But the responsibilities on this side of the seas are as great ; humanity is as frail ; and humanity in public servants, not least when engendered by the soul-inspiring training and ideals of the healing art, is hardly less generous or strong than in the upholders of

the public health throughout the "graft-scandals" of California.

The true instincts of the medical man are for the elaboration of truth and the service of the world. It is well that the public should occasionally be reminded of the extent to which this spirit of innate patriotism imbues the whole profession, in all countries and in all societies, even in face of the blind eye of the egregious Mayor Schmitz, of the city of San Francisco.

## CHAPTER XVI

### FEDERAL HYGIENE IN THE STATES

WE talk a great deal nowadays of the glorious possibilities of the British Empire. It has grown up haphazard, despite the efforts of the British public to forget it, of politicians to be rid of it. We now see—we selfish people of the motherland—that the empire is one of our greatest assets. But in the struggle of the nations for survival of the fittest haphazard arrangements are of no use; our sense of the artistic, poetic and natural must be violated, the empire, if it is to continue, must be organised. We talk therefore of imperial defence and of commercial bonds within the empire. I venture to add the suggestion in this book of imperial defence against epidemic disease.

It is significant that our own offspring should teach us many lessons of the greatest importance in our task of empire management; and, as we look for many internal political experiments to New Zealand, so we look for the result of many experiments in co-operation between different governments under one head to the United States of America—America more than Germany, because of the essential and congenital analogies, both in individual character and in public administration, between our American cousins and ourselves.

Such organisation of the public health under the federal government is found in germ in the "United States Public Health and Marine Hospital Service." This organisation is unique; independent of the navy or army, it works under a central bureau at Washington, and superintends, or at least supervises, the health of every port in the United States. The marine hospital service has its headquarter buildings and publishes its official documents in Washington, where it occupies in a small way the position of the sanitary department of our Local Government Board or of the ministry of the interior in a continental capital. The marine hospital, as this building is called, is a glaring misnomer; in Washington there is no marine and in this particular building there is no hospital. But it represents the department which has to do with quarantine and the sanitary protection of the marine or seafaring mercantile community throughout the whole of the United States. It represents a federal board of health, and was established by an Act of the United States Congress as a result of the panic created by the spread of yellow fever in the Southern States in 1878. Health-legislation—how well we know it in England—usually has to wait until so many innocent victims have died for the people. This change was in keeping with the general principles of American government, by which centralisation is extremely difficult and is only attempted when obviously necessary in matters such as those of diplomacy, public defence and the tariff. Defence, however, against infectious disease from without

is equally a matter for national rather than for local action; and so it was thought sufficient to establish a national public health bureau for this purpose alone by means of the marine hospital service. The term "quarantine service" would in reality better explain its functions. While repudiating all intention of interfering with the state legislatures, this service, on behalf of the federal government, has sent its commissioners to the different seaport towns to supervise the arrival of foreign persons and merchandise and deal with them under the orders of the central government. Thirty-nine quarantine maritime stations had in 1904 been thus established.

This system was primarily directed against the foreigner, but it was before long extended to the "enforcement of rules and regulations made by the secretary of the treasury to prevent the introduction of contagious or infectious diseases into the United States from foreign countries, and into one state or territory from another." If the municipal or state authorities do not apply such regulations efficiently, the national government has a right to appoint its own officials to enforce due observance of the rules. The next step taken towards co-operation between the states was the issue by state, municipal and port sanitary authorities of weekly reports of the sanitary condition of ports and places within the states. The United States as a nation claim thus at least the right to know what is taking place within each state. But there are no funds available by which experts may be sent to hold local

courts of inquiry and report, as is done by our Local Government Board.

A still further step is that the supervising surgeon-general of the marine hospital service, under the direction of the secretary of the treasury, has now a right to do more than inquire as to the disease in each state ; he has the right, by an Act of 27th March, 1890, to promulgate such rules and regulations as may be necessary to prevent the spread of that disease from one state or territory to another, the Act imposing a fine of five hundred dollars, or two years' imprisonment, for the violation of such rules.

But it is one thing to prevent disease being imported to any country or state ; it is another to take precautions which may prevent such disease taking root. It is just this power which is lacking at Washington. According to the intelligence and activity of local authorities, so is the chance of any particular state of escaping infection. Where, as too often happens, the authorities are not particularly intelligent, or, as at San Francisco, are too afraid of vested interests and the displeasure of local leaders to carry through even the most necessary measures of sanitation, there the sword of Damocles will always hang, and an outbreak may at any time occur. As at San Francisco, it may then be of considerable use to send a special commission to assist the local authorities in the administration of measures to exterminate the disease or, to a large extent, to supplant them ; but in many cases the horse is stolen before the stable-door is locked. By degrees the United States, like ourselves and other powers,

will doubtless recognise the value of such centralisation of sanitary administration ; and, although opposed to the spirit of the American nation and constitution, as is the army, as is the navy, it will no doubt be effected within the next fifty years.

The marine hospital service finds considerable assistance in a law administered by the department of agriculture, and dated 3rd March, 1891, under the title, " An Act to provide for the inspection of live cattle, hogs, and the carcasses and products thereof, which are subject to inter-state commerce, and for other purposes." Similarly, more recent regulations forbid the sale of vaccine lymph, antitoxin serums and other similar articles, unless produced by licensed manufacturers working under the supervision of inspectors appointed by the federal government. In the making of lymph and the canning of meat, the principle of national control is admitted ; but national control of the imported disease is far easier and less open to opposition, and it is this work which is the principal and most striking function of the marine hospital service.

When the existence of plague in San Francisco came to the ears of the government, it was this service which sent a federal commission in 1901 to inquire into the state of affairs. For three years Dr. Blue and his assistant had, by arrangement with the local authorities, been busily engaged on the sanitation of the slums, and as a result plague appeared to have died out. In the week ended 13th August, 1904, over 2000 rooms had been inspected, and over 2500 persons ; 4 dead had been examined ; 41 rats

had been examined bacteriologically ; over 200 places had been limed and disinfected ; the Danysz virus for extermination of rats, conveying to them a bacillus which is death to them but harmless to man, had been spread throughout ten blocks of buildings ; and various details of sanitary work had been effected.

These facts are quoted from the weekly reports of the public health and marine hospital service. This weekly bulletin is the model statement of the facts on which the work of such a federal department should be based, and is highly suggestive for our own use. It consists of two parts, the first affecting the United States ; the second, foreign and insular, concerning all other parts of the world. The reports are addressed, directly or indirectly, to the surgeon-general at the head of the service, and give a clue to the many-sided, thoughtful and statesman-like work in which the members of the service are engaged.

Let us run through the contents of the bulletin in any particular week, that for instance in the week ending 13th August, 1904. Through the director of the hygienic laboratory at Washington, evidently an appanage of the marine hospital service, the chief of the division of zoology sends a preliminary report upon an investigation into the so-called " Spotted Fever " (tick-fever, or pyroplasmiasis) of the Rocky Mountains, the result being negative to the usual theories of the disease. Allusion has already been made to a second report—that on the work at San Francisco. A third report announces the discovery of the anopheles mosquito in Key West, due credit being given by name to the medical

undergraduate who made the discovery. Work is reported on account of smallpox in Northern Maine, on the Canadian border ; other work on account of yellow fever in Texas, and especially on the lower Rio Grande, and the proceedings of the inspection service along the Mexican border. Notice is given of yearly and monthly reports of the chief facts, statistical or otherwise, concerning the public health of the various states and cities, with a discussion of the mortality figures for June in New York state and city ; and reports are given as to the alien immigrants arriving at the various ports during the preceding week and month.

An eye is thus kept upon serious illness of an epidemic character affecting any part of the United States, special commissioners being sent down to investigate any unusual outbreak, as Dr. Blue was sent down to San Francisco, or as Dr. Bulstrode might be sent down to inspect oyster-beds at Whitstable. These reports are followed by tabular reports from all national quarantine and inspection stations, enumerating the vessels that have sailed or arrived, with certain details concerning their freight, and any action that may have been taken for their disinfection.

The first part of the weekly bulletin ends, in this particular instance, with tables of all the smallpox cases reported for the previous two months from every part of the United States, over 2500 in number, with 60 deaths ; a similar report of yellow fever, 6 cases in six months ; of plague in California for the previous four and a half years—22, 30, 41, 17

and 9 cases respectively, only 6 of which recovered ; and the weekly mortality table from the chief causes of death of some sixty cities of the United States.

So far, we may say, there is nothing very original in this bulletin. The weekly mortality table does not in any way correspond in importance and care of production with the weekly report of our registrar-general ; there is no systematic record of deaths notified for the several parts of any area, corresponding to that now issued by the local government board for England and Wales ; and in this country the detailed reports of the medical officer of our local government board, although rare in their appearance, give the public ample opportunity of knowing for themselves what our central department is doing, so soon as it can be published with sufficient precaution to prevent misunderstanding.

It is the second part of the United States bulletin that may attract our attention for a few pages. It consists of a detailed and full series of reports concerning the public health at every port of importance throughout the world. We open upon the official report of plague in the Cape Colony, issued from the colonial secretary's office at Cape Town on 11th July. This bulletin is issued five weeks later. The next report is from the department of public health at Brisbane, dated six weeks previously and forwarded by the consul-general at Melbourne, giving details as to the rats and mice examined at the bacteriological institute and destroyed during June, and as to the results of treatment in the plague hospital. A similar report on plague in rats and man

is sent from Sydney, and another from Western Australia, also forwarded by the consul-general at Melbourne. The consul at Bahia, with less complete opportunities, reports the cause of death for all bodies buried during July in the Bahia cemeteries and the occurrence of fifteen cases of smallpox in the last half of the month. An acting assistant surgeon reports the vessels and cargoes leaving Rio and the measures taken to prevent the spread of plague in Brazil, including the use, at least in hospital, of "anti-pest" serum and vaccine. A note follows as to the installation of a complete disinfecting plant in the port at Para, with a general report upon the mortality and sanitary condition of Rio a couple of months previously. Reports are published from British Honduras and Canada, giving in the latter instance the number of immigrants rejected after inspection. The next report deals with China, on the authority of past-assistant surgeon White, giving an account of plague, smallpox and cholera in the various districts of Southern China, the maintenance of quarantine at nearly all oriental ports against arrivals from Hong-Kong and details as to the ravages of an epidemic disease, believed to be rinderpest, in the jungles of Lower Burmah. The reports from Limon, a fruit-port in Costa Rica, and from Panama are of importance in connection with the canal, while that from several parts of Cuba shows the conditions for which the states undertook temporary responsibility, including a condemnation of sanitary conditions associated with outbreaks of scarlet and enteric fever at Matanzas, and an outline

of the problem with which the city is confronted in seeking to remedy this evil. It is surprising to read that the water-rent is so high—at fourteen dollars, or sixty shillings, per month—that it is impracticable to forbid the poorer classes the use of contaminated water from the city wells. From Germany not only the weekly death-rate of Berlin and other chief cities, and its principal constituents, are given, but also the German report of plague, cholera and small-pox in Egypt, Japan, British South Africa, Brazil and Turkey. From India two pages of figures are given as to the mortality in Bombay city from various causes in previous months and years. A brief statement is also made of health at Calcutta. Reports from South and Central America and the West Indies are of course of the greatest importance to the United States ; and so we have detailed accounts of the work being carried on against yellow fever and of mortuary records in different parts of Mexico, Nicaragua, Panama and Peru ; while the dangers threatened to the Philippine Islands from cholera, from plague and from smallpox in Hong-Kong and Saigon, are fully described.

A quotation from this paragraph shows the nature of the information embodied in the bulletin, and its evident advantage to sea-borne commerce :

“ The contagious diseases report of Manila is particularly encouraging at this time, because the quarantinable diseases in the near-by foreign countries have been decidedly on the increase. At Hong-Kong alone ninety-nine cases of plague were reported for the two weeks ended June 25th ; at Amoy plague is reported to be increasing very rapidly ; at Saigon the cholera situation remains

unchanged. The French bills of health report cholera as being present in the interior, but information obtained from ship captains is to the effect that the disease is also present in the port of Saigon. The masters of vessels plying between this port and Saigon have shown a great willingness to aid in preventing the introduction of cholera from that port. So far as it has been possible to ascertain they have faithfully carried out the suggestions that none of their crews be permitted to go ashore, to take aboard no fresh vegetables, and not to take any water at Saigon if it can possibly be avoided. In view of the fact that there are no available data upon the wholesomeness of the Saigon water, every ship that arrives here from that port carrying Saigon water is required to discharge the same before entering the harbour, and the tanks are disinfected with permanganate of potassium."

Thus it may be seen that merchants shipping goods to the Philippines on 20th August were able at least to know the condition of affairs in Manila and the ports connected with Manila two months previously; those shipping goods to Hong-Kong or Amoy would know the danger they ran of being quarantined afterwards at any other port at which they might call, on account of plague; and those shipping goods to Saigon would know that there was a considerable possibility of their ships' crews being attacked and decimated by cholera and their cargoes destroyed. The commercial value of this information is undoubtedly of the first importance.

Further evidence is given of this care of the federal government for their citizens trafficking abroad by a circular quoted in the bulletin, signed by an assistant surgeon in the marine hospital service, approved by the United States consul and the consul of Panama, and headed, "Callao, Peru. To Steamship Com-

panies, Agents, Masters, Physicians of Merchant Vessels, and Others concerned." This circular draws attention in detail to the "requirements of the United States quarantine regulations, which are to be observed at this port by vessels bound for ports in the United States and the republic of Panama."

A brief account follows at random of yearly and monthly statistical reports of mortality from various cities and countries all over the world—England and Wales, Lourenço Marques, Batavia, Nagasaki, Georgetown (Demerara), Barcelona and Gibraltar. Last of all, reports received from United States consuls through the department of state and from other sources as to cholera, yellow fever, plague and smallpox, the four most dreaded human scourges of the tropics, are given as fully as is possible under the circumstances.

The information given in this bulletin is partial in the extreme, and it is at least one if not two months out of date by the time it is published ; but that it forms the nucleus of information which might be of the greatest value to the shipping world is beyond question. For British purpose it may well be suggested that an essential undertaking of our Board of Trade or of any department that may be constituted for imperial government should be to institute a system of health-intelligence, to collect information with the help of the colonial, foreign, India and war offices, of the local government board and of the admiralty, to estimate its value and to publish the results in the most convenient form and with the

least possible delay for the use of the mercantile community.

The precedent has only been established this year in the weekly publication by our local government board of the returns of notifiable disease in the United Kingdom. This requires extension to ports and countries overseas. At present, but only when attention has been drawn to certain conditions demanding notice, such as the prevalence of plague in India, South Africa, or Hong-Kong, official statements appear to be cabled home weekly and issued to the Press. This system of casual information should be replaced by a weekly system of notification of all infectious diseases of importance to commerce, from every port and chief city, not only in our own empire but throughout the world, where there may be a British consul, a ship, a resident, or an official representative of any sort. These reports, received by wire during the slack hours of the week-end, should be published in bulletin form, resembling that issued by the public health and marine hospital service of the United States, on every Monday evening. By Tuesday, in that case, every British shipowner would know the epidemic dangers to which his business is subjected, as judged by a report only three days' old.

Is it worth while? Official experience teaches early that the worth of any proposal in this world must be measured by finance. If the government were to produce regularly, with the high authority that it could command, a bulletin of such value as this to the commercial world, the commercial world would probably be glad to repay it.

It is difficult, without the advice of an inter-departmental committee, to estimate what the cost of such a bulletin would be. But the personnel required for the purpose is already to hand ; the advantage would be like that of starting a newspaper with your correspondents already paid by other concerns and your plant established and kept going on a large scale by your other businesses. The cost of production would amount to little more than the cost of the telegrams at government rates and of an expert, with clerical help to deal with them. The bulletin, indeed, by the inclusion of advertisements, might become a most paying concern ; but that is one of the economies which it would seem futile to impress upon government, for reasons which they have doubtless often and fully considered.

It has seemed advisable to suggest a commercial ground for supporting the proposal of a weekly imperial bulletin of health, because neither our government nor the general public, nor even the commercial men themselves, have yet recognised, as is recognised in Germany and America to a considerable degree, the immediate pecuniary value of science to the concerns in which they are interested. If any proposal affect trade—affect trade, that is, directly—they are at once all ears to hear of it. If it affect trade only indirectly through scientific research, they want to be shown definitely and clearly how such scientific measures are likely to benefit trade. If research be merely proposed in the general hope that it may lead to the advancement of knowledge in the sciences on which trade transactions are based, then they consign

it at once to the tender care or eternal oblivion of private charity.

But, to those who have eyes to see, it will be obvious that here in the British Empire, here in London in the departments of government which supervise the all-pervading trade of our race, we have to our hand an agency which can present us with the most complete and regular statistical basis of the science on which rests the prevention of disease. As we of the health-service believe that to prevent disease is a task more honourable although less honoured than to cure it ; as we know that the prevention of disease depends to a large extent, especially in warm climates, on the prevention of infectious disease spreading in epidemics throughout the world ; so must we consider it of the first importance that we should know authoritatively and at regular periods the strength, distribution and movements of these plagues, in relation to the varied conditions of climate, habit and race in different parts of the world. Until that knowledge is at hand we are at a manifest disadvantage in considering their life history and in devising means to exterminate them and prevent their recurrence.

This task may eventually be undertaken by the international bureau of hygiene at Paris. But there are difficulties in the way of international action in such a matter ; and the result, if more comprehensive, would be less detailed. Nationalism is a stronger force than internationalism ; and reports from British representatives only would be standardised and of greater value. For the present therefore, at least, it is best to propose a report on a British official basis.

It may be hoped that the result of such a proposal will not stop at reports by correspondence. A system thus initiated would lead naturally to the employment of many highly-trained experts, whose large practical experience in various parts of the world and in various services is at present wasted in retirement, for further service in investigating, reporting and advising on such health-problems of different parts of the Empire as require consideration by other than the experts and permanent staff of the locality. It would co-ordinate the work hitherto undertaken by missions from the Liverpool and London schools of tropical medicine, by royal commissions, by experts casually employed by the colonial and foreign offices. It would lead to the creation of an Imperial General Staff to conceive and advise as to the execution of plans, on imperial lines and by general co-operation, for the arrest and prevention of pestilence and the promotion of health in every part.

As the basis of this organisation and as the necessary equipment for the campaign which it is the proud duty of health officers to wage against disease in every shore and sea, I ask for the weekly publication of the latest and fullest possible returns of epidemic disease from every place in which the British government is represented throughout the whole world.

## CHAPTER XVII

### MR. CHAMBERLAIN'S SPEECHES ON THE POLICY OF HEALTH AND EMPIRE

THE credit is due to Mr. Chamberlain of having been the first minister of the crown to realise and formulate the value of health to our imperial power ; and to adopt the duty of attention to the public health as an axiom of our imperial rule.

His attention was first drawn to the subject in connection with the health of the administrative staff of our imperial colonies. Appointed colonial secretary in 1895, he had already succeeded in securing the establishment of the London School of Tropical Medicine, as the first step in a practical policy for discovering and removing the cause of tropical diseases, when on the 10th May, 1899, he presided at a festival dinner of the Seamen's Hospital Society and appealed for funds for the school and for the enlargement of the branch hospital in the docks to fifty beds. The House of Commons had voted £3500 for this object and promised £1000 a year for its maintenance. Lord Lansdowne, as secretary of state for war, said that of all the enemies the British soldier had to encounter, tropical diseases were the most formidable.

' We are met here to-night,' said Mr. Chamberlain,

‘ to promote Imperial Policy. The British Empire contains, I suppose roughly, something like 300 millions of coloured people, living mostly in tropical climates, and it is the government and control of the tropics which form the principal part of that “ white man’s burden,” the immensity of which has caused some of our statesmen to regard the future with anxiety akin to fear. The other day Mr. Rhodes in a speech referred to a conversation that he had had with Mr. Gladstone, in which that great minister had said that he was afraid lest the number of men qualified for colonial administration should be insufficient for the work which an extended empire involved. For myself I agree with the reply which was made by Mr. Rhodes. I believe so long as the British character remains unchanged, the opportunities of distinction, the prospect of adventure, and the love of responsibility which is deep-seated in our character will always prove a sufficient temptation to secure that the supply shall be equal to the demand. But, my lords and gentlemen, that does not relieve us from the obligation to see that every precaution is taken and every effort made to prevent this splendid material, those potent instruments of our greatness, those props of our empire, from being wasted and thrown away owing to the neglect of precautions, which, if they were properly fulfilled, might save their lives or extend their usefulness.

‘ It is impossible for anyone, who occupies the position which I have the honour to fill, not to be painfully impressed with the tragedy which is always being enacted, that of the mortality which cuts off

young men of great promise in the very outset of their career, which strikes down in their prime experienced administrators and able and conscientious officials, which, even though it is not vital to individuals, at all events weakens the service by constant illness, disorganises the administration and prevents anything like continuity of policy owing to the frequent breaks which are necessary in order that impaired health and strength may be restored.'

The policy proposed then should consist of (1) training medical practitioners for the tropics to investigate the cause and cure of disease; (2) instructing all who go to the tropics in the rules of health; (3) providing the best medical and nursing attendance on the sick. Mr. Chamberlain referred to the Colonial Nursing Association, to the work done in Italy and by Dr. Ross in India as to malaria, to the investigation about to be undertaken in Italy and in Central and West Africa by the Royal Society on malarial and blackwater fevers, to the Colonial Office circular to the schools of medicine, asking them to give their students some special training in tropical diseases. But these measures would be incomplete without a school devoted to tropical medicine, and for that he made an eloquent appeal for funds.

'I think I am not too sanguine when I say that we have a right to expect a bountiful and beneficial harvest. Why should we despair? Is it too much to ask of science that it should confer this great benefit upon mankind? When I look at what has been done in the past by the efforts of science, the plagues of the Middle Ages which devastated vast

districts and which have now ceased out of the land, at the fact that within our own time cholera and typhus have lost most of their terrors; when I remember what we have been told by Sir A. Hoskins and how in the West Indies the frequency and virulence of the epidemics of yellow fever have been greatly diminished; when I know that colonies like Hong-Kong, cities like Calcutta, which during the present century earned the evil reputation of being a white man's grave, have now become comparatively safe, I say there is no reason to despair that science may yet do something to lessen the unhealthiness of other settlements, more especially of those in Africa, thus removing the greatest hindrance to the development of that vast continent.

‘My lords and gentlemen, the man who shall successfully grapple with this foe of humanity and find the cure of malaria, for the fevers desolating our colonies and dependencies in many tropical countries and shall make the tropics liveable for white men,—who shall reduce the risk of disease to something like an average—will do more for the world, more for the British Empire, than the man who adds a new province to the wide dominions of the Queen. And those who co-operate in securing this result, whether by personal service or by some pecuniary sacrifice will be entitled to share the honour and to add their names to the greatest record of the benefactors of mankind.’

On the 25th of July of the same year Mr. Chamberlain and Mr. Asquith spoke at the Annual Meeting of the Colonial Nursing Association at Stafford House.

Founded in 1896 by Mrs. Piggott of Mauritius, this body has now sent 258 nurses abroad and finds the age 35 to 50 best. It was only appealing for a modest endowment of £5000. Mr. Chamberlain testified to the advantages derived by tropical colonies from the services of the Colonial Nurses. A letter from Col. Willcocks on the Niger River declared that the recovery of some of his young officers from blackwater fever was due to the attention and care of these nurses. 'It is a mission to all those who are interested in the development of the great empire of which we form a part. Lives such as these, so precious to the empire, the lives of those who are the successors of those who gained the empire for us, such lives ought not to be wasted. We owe it to them and to ourselves to do all in our power to preserve them, and to see, so far at all events as that may be possible, that when they are struck down, as unfortunately they often are in the course of their duty, by illness, at all events they shall not want the tending of skilful and kindly hands, and that sympathy, that womanly attention, which will be found to be the best anodyne for their pain and perhaps the most effective cure for their disease.'

On the 15th March, 1901, a deputation went to the Colonial Office representing the London, Liverpool and Manchester Chambers of Commerce and the Liverpool School of Tropical Medicine, to present a statement which proposed :

“(1) That the governments of the various colonies on the west coast of Africa be invited to pre-

pare schemes, with estimates, for the complete organisation of sanitation in the coast ports in the vicinity of quarters permanently occupied by any considerable number of Europeans, especially with regard to

“(a) removal and disposal of refuse ;

“(b) complete surface drainage of the soil and removal of bush and undergrowth ;

“(c) removal of native huts where their presence is a menace to the health of Europeans ;

“(d) institution of sanitary regulations for observance by the public within the areas indicated above.

“(2) That at the same time a sanitary commissioner, or sanitary commissioners, be appointed by the colonial office to visit repeatedly all the said colonies, and to report to the secretary of state the condition of sanitation in each colony, and the steps being taken to improve it by the local authorities.

“(3) That where new settlements are being planned, quarters for Europeans shall be arranged as far as possible on the Indian cantonment model, and that special regulations shall be made to prevent the overcrowding of such cantonments by the general public.”

In reply Mr. Chamberlain, in disagreement with some of his predecessors in office, expressed his belief in the future of West Africa, and addressed

himself to the proposition that health was a financial asset, which justified expenditure on its preservation. After noting the influence on morality of the unhealthy and lonely conditions of life in many tropical posts, he referred to the importance he had found attached to this subject by every colonial governor that had returned home from the coast since he had been at the Colonial Office. He differed from the deputation by showing that more was being done in this direction than was realised, and, in pointing out the limits of expenditure justifiable on sanitary inspection, said :

Sanitary inspection was carried on in this country (England) under circumstances to which the Gold Coast presented no parallel. Arrangements here could be made without difficulty which could not be made in a new and tropical colony. Even here they sometimes complained of being a little overburdened by inspectors, and said that a counsel of perfection was sometimes put before them which was not really possible of attainment. If they were to have a house-to-house inspection in those colonies on the West Coast, of natives as well as of Europeans, and inspectors in turn were to be themselves inspected by a superior officer with all the scientific requirements which were necessary, and if, again, those inspectors were to be supervised by travelling inspectors sent over from this country, he confessed that he trembled at the budget which would be produced, and there might be a reaction in consequence of attempting too much. No doubt the matters to which his attention was called deserved and required

urgent attention. But schemes for which they asked were already in preparation, and in some cases had been prepared. The water-supply was undoubtedly of first-rate importance, but also, unfortunately, it involved a very heavy expenditure. The question of sewage disposal was another question, the difficulty and magnitude of which everybody who was connected with the government of a big town must be fully aware of. But, still, all these points had been and were receiving the careful consideration of the Government, and he trusted that they might be able to do something in connection with them. A great deal had been said, with reason, as to the danger caused by the too close proximity of the European residences to the residences of the native population. In Accra that matter had been to a great extent dealt with, and the dwellings of the Europeans had been moved away from those of the native population. In Sekondi, which was going to be a considerable place, owing to the establishment of the railway, which if continued to Kumasi would be of great importance, Major Maitland had already acquired a very considerable portion of land, with the object of building upon that land, separately and away from any native population, the buildings required for any Europeans. In other places the same sort of precautions were already being taken. He had great hopes as a result of the great railway work which was now going on, of which about 400 miles had been made in the West Coast colonies during the five years he had been in office. The general effect on commerce and trade of this had

a very definite bearing upon the question they were now discussing, because if they could have railways running into the interior and a more elevated country it would not be impossible to establish in all the colonies sanitary places, to which at all events a considerable amount of the administrative work of the colonies might be moved and with it a considerable portion of the European population. Of course the coast ports must always have a European population dealing with the Customs and the large export and import trade. Even with that population, if the railways were sufficient, and if, as he hoped, they were very greatly and very quickly extended, even that population might be carried out of the town at short intervals, perhaps every day, certainly every week, and they might enjoy at intervals the fresh air and better conditions which he hoped would have a very considerable effect upon their health.

He suggested therefore the appointment of a small sanitary commission to consist of three members of the chambers of commerce, with a sanitary expert and a representative of the Colonial Office.

He should refer to them also the question of how the funds were to be provided. He would ask them to estimate the cost in each colony and to report to him how the money required to carry it through could be provided with the least inconvenience to those concerned. He was glad to see in the memorandum of the Manchester Chamber a statement to the effect that they were not unwilling that a sanitation rate should be levied, either in the form of an additional import duty or some form of local taxation, the

money raised to be devoted solely to the improvement of the health of the colonies. That would be a matter for this Commission to consider. But the Manchester Chamber went on to say that they would like to draw attention to the enormous increase there had been in expenditure in recent years and recommended that it should be raised by economy in other directions rather than by increase of taxation. If it could be found by economy rather than by increased taxation, they all agreed that that would be a far preferable method. To this same Commission he would refer this branch of the Inquiry and if they could recommend economy which could be carried out without injury to the administration or to the security of those colonies he would be only too glad to consider it favourably.

On 30th June, 1904, a banquet was given to Mr. Chamberlain by the Royal Institute of Public Health, "in recognition of his services to preventive and tropical medicine whilst filling the office of Colonial Secretary, 1895-1903." The large and distinguished assembly present in his honour included Mr. Lyttleton, Lord Onslow and Mr. Balfour. In proposing his health, the President of the Institute referred to the municipal undertakings of Birmingham, for which Mr. Chamberlain was in large part due, and showed his exceptional activity in promoting health in the tropics.

Mr. Chamberlain in his reply disclaimed exceptional credit for his action. 'I claim no more than may be usually claimed by every other statesman, by everyone who is interested either in social reform

or in colonial development—that is the interest which we all take in the work of medical research and preventive medicine, and the expectation we entertain of the great results which may be expected from them.’

He spoke of diphtheria antitoxin and the advances made in curative medicine. ‘But, while we look with confidence to the further results of curative medicine, I think we shall all be agreed that preventive medicine is better still. Now, at any rate, the importance of securing healthy conditions of life is recognised by everybody who cares for the welfare of his fellow-creatures. I recollect very well the speech which was made, I think in the early seventies, by Mr. Disraeli, and which was at that time the subject of some ridicule from myself and others, in which he spoke of the importance of sanitary reform as the foundation of every other reform. None of us are likely to ridicule such a statement now. Now we feel that sanitary reform is not unworthy of the attention of the highest statesmanship. Now we recognise that without it social reform is an empty phrase. The housing of the poor, the attempt to prevent the physical deterioration of the race, and all other matters to which we legislators devote such part of our time and attention as we can spare from party conflict, all these things depend, are founded upon, sanitary reform. Preventable disease, at this moment, is, as we all know, a great agent for filling our workhouses, for raising our taxes, for weakening the fibre of the people, for preventing us from competing successfully in that

eternal struggle for existence which must go on as long as the world shall last. In peace it is of the utmost importance ; in war the same cause destroys more of our soldiers than the bullets or the swords of the enemy, and meanwhile the administration of the army is lessened in efficiency by preventable disease to which the agents of the Empire are constantly subject. And, Mr. President, I may be excused in regard to my experience if I say that it is this branch of preventive medicine which at the present time enlists my warmest sympathies.

‘ For, after all, I repeat what I have said on other occasions. The work of this century, or at all events, of the beginning of the century upon which we have entered, is the consolidation of our Empire. And this is one branch of the greatest of all subjects ; how are we to fulfil the task which Providence has laid upon our shoulders, a greater task than has ever been imposed upon any other nation, a task which we are now fulfilling not without success, but the greatness, the increasing greatness of which may well fill even the boldest of us with some anxiety.’

The work of our countrymen in the colonies was then described, both in peace and war and in the prevention of war and slavery. ‘ These men are the greatest assets of the Empire. Let us prize them and value them, let us do everything to keep them in the vigour of life ; and it is for that reason that I attach so much importance to these investigations, to those studies, to this research, which is going, I verily believe,—sanguine optimist as I always am—in the course of time to make these tropical climates, which

have been each in their turn the white man's grave, to make them places where white men can live in comfort. It is because of this that I wish to conclude by saying that, after all, one of these almost unknown students working in laboratories in London, Liverpool and elsewhere may be doing more good for the Empire than any statesman has been able to do, however high his position. It is with that feeling that I have had so much pleasure in attending this meeting, and it is with that feeling that I thank you one and all most heartily for that sympathy which you have shown, I will not say with performance, but at all events with intention, to that ideal which I hope every patriotic Englishman sets before himself.'

Mr. Balfour, in replying to the toast of "Preventive Medicine and the State," epitomised the duties of the state in this regard, as involving, firstly, the internal problem of maintaining, despite increasing urbanisation, 'the inevitable physical basis of every great national and imperial aspiration'; and, secondly, the external problem of turning the extraordinary natural resources of the tropics to the best account. It was in this respect, as well as in the other more public spheres of his official work, that Mr. Chamberlain would be reckoned on all sides as the greatest colonial minister the country had seen. 'Turn our great tropical colonies into places where the white man could live in reasonable health and comfort, and they would add, directly and indirectly, incalculable gains to the commercial future and industrial prosperity of this country.'

On the 12th January, 1905, Mr. Chamberlain attended a lecture by Major Ronald Ross in Liverpool on "The Progress of Tropical Medicine." In an informal speech Mr. Chamberlain let fall a definition of our colonial policy. 'I remember on one occasion a foreign monarch said to me, "Of all the things in connection with your British history, the one I admire most is your colonial policy." I said to him, "Sir, I think you do us too much honour. We have never had a colonial policy, but somehow or other, we have been allowed to blunder into the best parts of the world."'

And again he gave his tribute, as of personal obligation, to the imperial workers in the tropics, emphasising the debt due to those who by research or by practice help to prevent tropical disease and so bear their share in the foundation of the Empire.

The last public speech on this subject was made by Mr. Chamberlain in again presiding over a dinner in aid of the London School of Tropical Medicine, on the 11th May, 1905. He came back to them, he said, to rejoice in the past success and to provide for their future. His interest in that question was unexhausted, indeed unabated. This duty had increased in recent years with the continual extension of our territory, with the increase of our scientific knowledge and our opportunity and also with the awakening of our imperial conscience. We owed this duty to the vast population for which we had gradually made ourselves responsible. He praised the generosity of Liverpool in providing £40,000 for their school of tropical medicine; recalled the services

of the 503 students, officials, traders and missionaries who had even then passed through the London school; deplored their difficulties in raising, even with much assistance from the government and the empire, £30,000 in a city so dependent as London on tropical development, and he appealed for £100,000.

There could not be a more desirable application of superfluous wealth than to enable that institution to unite the work of the investigator and the work of the physician, which was after all the ideal union between scientific inquiry and its practical application. He asked them to sympathise with those workers of our empire who had already done so much to secure its renown, and who had contributed, and were contributing, to the happiness and welfare of the vast populations which we had gathered together under the protecting influence of a single flag.

It will be noticed that Mr. Chamberlain's advocacy of health as of imperial importance concerned itself mainly with the health of the white men, especially the administrators, in the tropics. That is only a small part of the problem considered throughout this book, which seeks to show the value of health in the rank and file, not merely in the officers' mess. His appreciation of this more general proposition as the basis of social reform is indeed shown by Mr. Chamberlain in practice as Mayor of Birmingham and in principle in the speech to the Royal Institute of Health, already quoted (p. 341). But in office the keen business eye, selecting the more pressing and more obvious needs of colonial administration, fixed on the most vulnerable point and attacked it with

a will, being assured of public sympathy for those who sacrifice their lives or health in carrying out a recognised imperial duty. Secure the health of the white man, and from the same source, if not from the same measures, the health of the masses will follow. Secure the health of the tropical dependencies; the white men need less reminder of the need of health-measures in their respective homelands.

Thus did Mr. Chamberlain lay the foundation-stone of a policy of health and empire, and start a tradition on which his successors have built and will doubtless build in future. It is the object of this book to promote this policy, and in doing so it has seemed well to recall the pioneer part played in this movement by Mr. Chamberlain.

## CHAPTER XVIII

### HEALTH AND THE BRITISH EMPIRE

#### THE PRACTICAL CONCLUSION

"It seems to me best to approach the prevention of disease, not so much from its humanitarian as from the economic point of view. Disease always causes a large expenditure of money . . . and mosquito-borne disease is especially a source of such expense. . . . The prevention of disease should be looked on economically as insurance against the useless expenditure caused by such maladies."—Professor RONALD ROSS, in Report of the Advisory Committee for the Tropical Diseases Research Fund for 1910, Appendix I., p. 21.

It is hardly too much to claim that Professor Ross by his proof, obtained by incredible labours in India under the most trying and discouraging conditions, that malarial infection was invariably conveyed by the mosquito, is thereby, with Pasteur and Lord Lister, the greatest preserver of human life and deliverer from sickness yet given or likely to be given to the world, and that he has thereby done more than any soldier, trader, explorer or politician to strengthen the British Empire. It is therefore of importance to note his emphasis on the financial rather than the humanitarian aspect of national and imperial health. It is not so much that philanthropy is of minor importance as that finance is the medium

in which the whole business of the world is transacted. What does it cost, what does it save in cash as representing so much thought and will-power, labour and raw material? That is the problem directly or indirectly in every proposal, worldly or other-worldly, that presents itself to the efficient man. The outcry of certain pseudo-philanthropists against money-making is due either to shallow thought or slipshod expression. The objection should be to faulty money-spending.

It has been the aim of this book, as of the travels on which it was based, to prove that health was a matter of business efficiency in imperial welfare. It is also, as in the case of Indian plague, a matter of humanity; and on that score may attract occasional and ephemeral attention. But governments and the public take a purely fatalistic and careless view of it. A despatch to the Indian government, a circular to overworked district commissioners, a report as to the need of economy—and the matter drops. The local administrators know it is only a matter of philanthropy; agriculture, police, education on western lines are solid business, and it is on these they will be judged.

Granted, however, that we are learning to recognise the solid money-making worth of every healthy citizen, that we are learning in civil life the hard lessons learnt by the army that medical work on preventive and strengthening lines is essential to the working, fighting strength, let us consider in conclusion the practical steps available to secure the utmost physical efficiency and therefore wel-

fare for the 400,000,000 inhabitants of the British Empire.

#### THE NEED OF COMMON ACTION

Of all departments of national life, none more urgently requires the widest possible field of study and action than that of health. Health depends on the relation of the human frame to its environment, animate and inanimate. It is essential to discover the limits of this relationship before we can understand the cause of its disturbance. It is absurd to confine our study of health and disease to a single race, living in fixed conditions in an equable climate. Experiment on the human body is subject to natural restrictions; experience under the widest possible range of circumstance throws a wider light on its capabilities.

Study of health and disease, therefore, should extend to the whole animal and vegetable creation; should extend to all races of mankind in every climate and condition of life. Manson's study of elephantiasis, Ross's study of malaria, have turned attention at home to the part played by flies, fleas, ticks and other insects in the spread of the commoner infectious diseases. The result is already seen in the extraordinary diminution of infantile diarrhoea and mortality in the last few years. It is the unfortunate heritage, not the fault, of the medical schools that they show an utter lack of appreciation of these possibilities and of the need of this wider view. Tropical disease, botanical and veterinary pathology,

are to them things apart ; their study and teaching of medical science is limited to the narrow groove of curative medicine as applied to man, the Englishman, in England ; and few of their pupils can realise the full scope of health and disease until their subsequent duties in life bring them in touch with different conditions to those seen at a general hospital in these isles.

It is of importance therefore to co-ordinate the experience of health and disease in each category of life, in every part of the world. It is on these lines that M. Jacques Cazotte conducts the International Bureau of Hygiene in Paris. But international systems and inquiries have limitations of another order ; they lose in driving-power and in co-ordination more than they gain in breadth, at least as compared with the possibilities of similar undertakings throughout the British Empire. Some nations hide awkward facts ; others deliberately lie ; we alone adopt the policy of declaring the whole truth, and if our news be false the ambassador concerned makes immediate inquiries. But the diversity of race and climate, which our empire affords, and of every condition compatible with life, offers a complete field of study, complete enough at least for the present, in this regard.

The aim too of international effort, as of pure science, is too remote from daily life to attract the co-operation of the inexpert. Nationalism is a growing, not a dying, force ; it is a most effective handle to the machinery of life. As charity must begin at home, so should research and defence of life begin with the most concise unit capable of

supplying the necessary factors ; and that is, for British sanitarians, the British Empire.

The assistance of the inexperienced but intelligent layman is indispensable. The expert is indeed the keystone of the arch ; but the arch consists and is founded on the common life. Both in administration and also in the observation and reporting of facts, which constitute the most important groundwork of sanitary discovery, health-officers must work through their colleagues in general medical practice ; and doctors all must work through the individuals they serve. As health in the school depends in the end on the teacher, health in the army on the company officer, so health and its investigation in the community must depend on those responsible in various degrees for the daily life and work of the community.

The basis required for effective development of the imperial health is a co-ordination of the forces that influence the health and disease of all classes and races under the rule of King George.

### INTELLIGENCE

The first requirement in morbid, as in military, warfare is a proper system of intelligence. Intelligence there is in abundance ; blue-books without end ; reports from every microscopic unit of British government—when required by some inquisitive parliamentary elector—"papers" and figures from every port, city and village that sings "God Save the King." It is the bane of modern government,

another misery inflicted by the inventions of the nineteenth century, that superficially accurate figures must be in stock to give to every reader of *Tit-Bits* a concise statement of every action that passes or should pass under the ken of any representative of the British taxpayer. In the plains of the Punjab one of the best of Indian civilians complained bitterly of the useless office work to which he was condemned, at the expense of the time available for the more primitive and infinitely more satisfactory system, both for rulers and ruled, of touring round his province and dispensing justice under the village banyan-tree. In every part of official life, a statistical committee should decide what figures were worth collating, what forms should be required to make these figures comparable and of value. The co-ordination of statistics bearing on health and disease throughout the Empire is urgently required.

The first report on the *Census of the British Empire* was issued as a three-and-fivepenny blue-book in 1906, and dealt with the figures of 1901. A glance through its sixty-four fascinating pages of letterpress, without reference to its three hundred pages of tables, shows the need, there expressed, for such a regulation of the decennial census. But the regulation must cope with real democratic imperial authority behind it. A decennial census is the basis of vital statistics ; and they again are the groundwork of research and progress in the advancement of the public health.

The next requisite is an *official annual report* on the health of the empire. Casual paragraphs in the newspaper, occasional papers in the technical Press,

reports of conferences and notices of epidemics in distant lands are of no permanent value. The public cannot collate them. Even the journals of tropical medicine and hygiene can only devote a small amount of labour and space to the task. As Somerset House has undertaken to produce a decennial report on the imperial census; as the medical officer to the board of education produces an annual report, reviewing the annual reports on school health throughout England and Wales; as the medical officer to the Local Government Board includes in his annual report some review of the prevalence of epidemic diseases throughout the world; so should some imperial organisation issue an annual review, in due proportion, of imperial health.

But annual reports fail to give information of current events while they are still passing. In our sixteenth chapter we have already stated the usefulness of the *weekly bulletin* issued by the Marine Hospital Service of the United States and have shown the value of a similar weekly issue for our own empire.

Port medical officers know the value of such returns in assisting them in their invaluable work of defending their countries against attack from imported disease. The health officer of Shanghai sent me recently copies of weekly returns received by him from the several ports in touch with his own—Japan, Hong-Kong, the Philippines, Penang, Calcutta, Colombo and Bombay—two or three weeks late. A weekly system of notification and distribution

from a single imperial centre by wire would save many an outbreak and much money.

Any organisation for the collection of such information would thereby be enabled with the utmost advantage to issue official *news to the Press* from time to time of disease occurring in the several dominions and possessions ; of research being conducted and remedial works undertaken, with their cost and result ; of conferences held, like the imperial malaria conference held at Simla in 1908 ; news which should be invaluable in arousing and maintaining public opinion and of unique importance to the whole tropical world, whereas it is at present bottled up in the official pigeon-holes or rubbish baskets of each separate country.

A single instance may be given of the need for such mutual information and concerted study. *The Times*, in its commercial supplement of 21st January, 1907, published an interesting article on " Mining practice ; comparative efficiency of labour on the Rand and in Kalgurli." The prevalence of miners' phthisis in the South African mines is in pitiful contrast with the complete absence of locally-contracted cases of phthisis in the Australian. Better ventilation and a less dangerous dust at Kalgurli do not account for the whole difference, the balance of which is attributed to the habits of life on the Rand and the complete change of clothing of every miner on leaving work each day at Kalgurli. Here is a clear case for the exchange of information, dependent at present on a chance article in the Press.

Such an organisation as is suggested would be

well fitted to issue pamphlets, to employ lecturers and advisers, to make use of *various educational methods*, which may conduce to a proper understanding and improvement of the conditions that make for or against the maintenance of health and strength. It is melancholy to consider that the recent imperial education conference in London did not so much as touch on the questions of physical education and promotion of health. And yet we are officially told that our Board of Education "look upon the work of physical training as a national service from the point of view of education and discipline as well as from that of physique"; and that the reader of their reports will find "a new understanding of the amplitude, purpose and opportunity of education, a new application of it, fresh fields to be conquered by it." There is, in fact, no co-ordination of intelligence on matters of imperial health, no organisation prepared and required to take a conspectus of the whole problem and to urge forward to the conquest of these fresh fields. Such an organisation is urgently required.

#### AUTHORITIES CONCERNING IMPERIAL HEALTH

Certain official organisations already in existence pledge the government to an acceptance of the principles here enunciated:

*A. An Advisory Committee for the Tropical Diseases Research Fund* was constituted by Mr. Chamberlain as Colonial Secretary in 1904 and issues an annual report on an expenditure of some £5000. In 1910 the imperial government contributed £1000, the

government of India £500, the dominion government of Australia £200, and the other governments of other tropical colonies over £1500 between them. Grants were made of about £2000 each to the schools of tropical medicine in London and Liverpool, with lesser sums to the universities of London and Cambridge. The last report for 1910 includes much interesting information not only on research but also on the effect of preventive measures in various parts of the world, including a report from Bangkok by permission of the government of Siam. It is however partial in the extreme and arranged merely as a non-edited series of independent reports.

*B. An Advisory Medical and Sanitary Committee* for Tropical Africa advises the Colonial Secretary on medical and sanitary questions connected with tropical Africa.

*C.* As a sequel to the international conference of Africa protectorates—French, German, Belgian, Portuguese, British—held in London in 1907, a *Sleeping Sickness Bureau* was established, also under the Colonial Office, in 1908. Five out of the seven members, including Sir J. West-Ridgeway as chairman, are amongst the eleven members of the Tropical Diseases Research Fund Committee. But the Bureau is housed by the Royal Society; is supported by the Royal Society, by the Uganda protectorate, and, as to one-fourth the cost of upkeep, by the Sudan Government; and is independently directed by Dr. Bagshawe of the Uganda medical staff. It publishes scientific work for those engaged in research or medical administration, and less technical informa-

tion for the use of lay residents in the African tropics. It is also engaged in mapping out the distribution of the disease and of blood-sucking insects.

*D.* As a result of thirteen or fourteen years' continuance of plague in India and the reports of a second Royal Commission, the India Office established an *Advisory Board on Plague in India*, with its headquarters at the Lister Institute. This Advisory committee has done admirable work in proving beyond all question the part played by the rat-flea in transmission of bubonic plague. It has not yet thrown much light on the spread of pneumonic plague, and it does not appear to have concerned itself with the practical or administrative problem ; nor indeed was it intended to do so, judging by its constitution and the methods of its work.

*E.* Both *naval and army medical services* have now *medical advisory boards*, including civilians, whose duties give them information and responsibilities with regard to sanitation in most parts of the world. In the composition of these boards, however, there is far too high a proportion of eminent physicians and surgeons who have had but little experience of preventive medicine in relation to the public health.

*F.* *The Colonial Office* is officially advised by Sir Patrick Manson, a pioneer in tropical research and clinical work, although his experience of public health work must necessarily be indirect ; the *India Office* by Surgeon-General Branfoot, a distinguished representative of the finest all-round medical service in the world ; and *the Foreign Office* applies to the Local Government Board for advice and often for the loan

of a medical officer who will never have lived in the tropics, in connection with the sanitary matters, often requiring foreign travel in tropical regions, with which it has to deal.

G. The London and Liverpool *schools of tropical medicine* receive grants for research and the London school is extensively subsidised by the Colonial Office for the specific training of its probationary medical officers.

There have been many *proposals for corresponding imperial action* in connection with other departments of government affecting the welfare of the several dominions over the seas, as for instance in the case of colonial agriculture, the complete scheme brought up at the recent imperial conference for a permanent imperial council. The reasons for which the latter scheme was for the present rejected would not however apply to the limited and utilitarian purposes of a health-scheme. As military and naval warfare require the creation of a general staff and a supreme Committee of Imperial Defence, so does the struggle for health require the creation of an imperial advisory council for the promotion of health.

#### THE AUTHORITY PROPOSED

For this purpose then it is suggested that each of the dominion governments should appoint one of their experienced medical officers of health as medical secretary to their high-commissioner or agent-general in London; and that these, with medical officers representing the several departments in Whitehall,

and with an equal number of lay administrators, permanently responsible for the consideration of health matters in their respective governments or departments, should constitute a permanent advisory council, with London as its headquarters. The members of this council must be chosen, not for their skill and eminence as physicians or surgeons, but for their experience and ability in connection with preventive medicine and physical improvement. This body would take over the work of the scattered advisory committees—not merely departmental in scope—already existing; it would divide its work in departments, probably by diseases, on the analogy of the sleeping sickness bureau and the advisory committee on plague; it would appoint special committees for the consideration of special topics, and would despatch missions under its own complete control, for local investigations of exceptional conditions.

During the last few years committees would thus, with untold advantage, have been formed for the consideration of Indian plague during the first eight years of the outbreak, when nothing was done; of sleeping sickness before two-thirds of the population of 300,000 in the infected district in Uganda had been killed by it; of beri-beri, tuberculosis and alcohol; of eugenics and the declining birth-rate; of midwifery and nursing; of sanitary inspection and health-visiting; of physical training and health in schools; of public education in matters of health; of the changes required in medical education in view of the different, the preventive task now demanded of doctors by the state.

Such a body would employ, for purposes of inspection and report, an ever-increasing staff, experienced both in temperate and tropical sanitation from the administrative standpoint. This inspectorate is already to hand, waiting idle in this country with nothing to do. Officers of the Indian, Naval, Army and Colonial medical services have had a unique experience of the kind required ; their records would show their respective worth ; most retire in early middle age, many even earlier ; few find congenial work at home that will make use of their special abilities and experiences. There are others, retired from service under municipalities or district boards, and doubtless many still engaged in all parts who would gladly take engagement in such a service. Laymen of experience would be no more difficult to find. As the Local Government Board by its admirable inspectorate—medical, engineering and architectural—has acquired the respect of every district in England and Wales, so would such an imperial inspectorate earn for the advisory council proposed the confidence and support of every government throughout the empire.

#### EDUCATIONAL MEASURES

Much space was devoted in the earlier chapters of this book to the fundamentally important question of *research*. Excellent as is the work being done in laboratories in all parts of the empire under the encouragement of the home or Indian or dominion governments, there is sore need for their co-ordina-

tion. In a campaign it is of little value for scouts to be forging ahead, as chance may lead them, independent of any direction and out of touch with the forces they are to protect. All over the world much time, money and labour are lost for lack of specific direction of research ; still more are lost because the workers, even under direction, work all day in their laboratories and see nothing of work outside. It is one thing for a scout to be guided by what he finds, for the investigator to be open-minded and equally critical of all results, however obvious ; it is quite another thing to work without any guiding idea. The most useful investigations are based, Darwin said, on imagination, constantly revised. Both the imagination and the revision can only usefully be supplied by a body of world-wide outlook in a matter so dependent as public health on the limits of immunity, susceptibility and endurance in the human frame. A central authoritative body, authorised by its effective scientific credit rather than by law, would use these laboratories as a general will throw out his scouts ; efforts would be concentrated, although not confined, to one problem, even one aspect of each problem, at a time. Every laboratory would be as one mesh in the dredger's net, working slowly upstream, confident that nothing can escape its reach. Every fact ascertained, yes or no, would be filed in its place in the records of the imperial bureau ; every worker would be enlisted in the general scheme and inspired by common and effective direction.

Much too is lost through the common tendency to specialism in research. As in clinical work so in

public health, research and practice should go hand in hand. The workers at present far too often live glued to their microscopes and cut off from the outside world. But the worker, above all, the director, in a laboratory should be in frequent and responsible touch with the actualities of the conditions he is investigating ; he should either devote part of his time to research, part to administrative duties ; or he should take spells of service, first at one, then the other. This comment is more necessary at home than abroad ; more in civilian work than in the government services, where research has constantly to be justified and where duties are frequently changed.

It is suggested, then, that in these ways research may be made far more effective and may so command a far greater measure both of private and of official support.

Of the need of such support there is no question. In comparison with the bacteria and other parasites already known, the microbic worlds as yet unexplored are as the universe to a single spot of earth ; in exploring the ultra-microscopic or ultra-violet or any other fields outside the range of our present instruments, we are in far worse case than Captain Scott in seeking the Antarctic Pole. The fields are beyond imagination ; we require endless work, well-directed work, well-endowed work to attract the permanent services of men of culture and thought and to secure them the requisite freedom from monetary care. The niggardly grants yet made by parliament for research are but mere drops in the ocean ; and since parliament, we are told, represents the electorate, it is the electorate and their leaders that

must bear the burden before the eternal judgment-seat of those millions of preventable deaths in the Punjab, inasmuch as they have starved the research on which the remedy could alone be found.

There is no further need to endorse the proposal recently put forward by Lord Northcote for an Edward VII. Tropical Research Fund and warmly supported by such representatives of imperial needs as Lord Crewe and Lord Elgin, Lord Kitchener and Lord Rothschild, Mr. Ramsay Macdonald and Mr. Joseph Chamberlain.

The value of all this research work, especially in relation to tropical conditions, has lain in the light it has thrown on the whole science of preventive medicine. But *the education of the medical officer of health* remains the same, and it requires considerable alteration. When the diploma in public health was first instituted, sanitary engineers, as such, did not exist ; and public health was mainly a question of water-pipes and sewerage. The curriculum and examination were ordered accordingly. After a time bacteriology was added to the course. But now sanitary engineering may largely be left to the engineers ; while public health is seen to depend far more on personal influence and habit than on material circumstance. More applied physiology ; more attention to the physical improvement of the individual is required ; for the work of school-health has shifted the basis of public health work. The course too should require residence and practical experience for a month in a small urban and the surrounding rural districts. Moreover, the science of preventive

medicine depends as we have seen on a far wider range of experience than that of the British Isles ; and tropical conditions of climate, government and race supply a far wider and sounder basis of study than those to which the teaching of public health is at present confined.

Courses and examinations should be to some extent altered in these directions ; provision should be made for centralising the teaching for the diploma in the London schools under a staff directed by a professor able to make a wide and academic, as well as a practical study of the whole subject. But unfortunately the body entrusted with the regulation of these matters is ill-equipped for the purpose.

Mention has already been made of changes required in the *general medical education* to meet the modern demand of the state for preventive rather than curative medicine, for attention to the community rather than to the individual. Medical education runs in a vicious circle. Physicians and surgeons control medical education and naturally educate their pupils to follow in their steps. If one of those pupils takes up public health, there is no room for him on the hospital staff, and he is thus eliminated from the bodies that control the curriculum. A hospital numbers fifty or sixty physicians on its staff, but not a single representative of tropical or veterinary medicine or of the public health. For the purposes of its medical school a local medical officer of health is engaged to fill a subordinate and unremunerative position, and so satisfy the requirements of the examining boards. But medical

students complain bitterly of their ignorance on the innumerable questions of public health they know they will have to face in practice ; and the consultants who rule the roost, in the schools, in the Royal Colleges of Physicians and Surgeons, and in the medical faculties of the universities, both for education and examination, seem blind to the important part that public health questions are likely to play in general practice ; blind to the prospect that faces a large proportion of medical students of practising, if only for a time, in tropical climates without any knowledge of tropical disease ; blind to the declining demand for their own function and the increasing demand for the prevention of illness ; blind to the inadequacy of their own presentment of medical and surgical science. The blame attaches not to them but to the vicious circle established by custom and law. The circle must be broken ; the constitution of the General Medical Council must be revolutionised and the whole curriculum and syllabus of examination be completely revised in the light of new conditions and new requirements.

But of even greater importance is the *education of the public* in the importance of public health. Disease is a calamity which essentially requires professional attention and advice. But the maintenance of health depends on the individual and can for the most part be ensured by a careful and intelligent way of life. He must certainly be defended against the main attacks of disease by a proper system of sanitation, devised and supervised by engineering, veterinary and medical experts ; but here again the

layman and the semi-laywoman, the nurse, are of first importance. The first attention therefore should be paid to the instruction of teachers in every school, college and university throughout the empire in the aims and methods of public as well as of personal health. The enlightenment of the next generation depends on the enlightenment of their teachers. Physical welfare, for the citizen as for the soldier, is the basis of his working strength ; and the basis of every moral and spiritual development. Given a proper system of sanitation and proper conditions of work, every man's health, every woman's health, and with their health to a large extent their happiness, is in their own hands. Medical officers of health and those who think with them should be given a large share in the training of teachers.

As for the average citizen, so infinitely more for the man and woman of position and influence a proper training in public health is required. It is our boast that India, for instance, is ruled on the whole exceeding well by a handful of young Englishmen. It is our melancholy experience that the Indian government has been powerless to check the ravages of plague and to prevent the loss of 7,000,000 lives ; that so many millions die every year of malaria ; so many millions more from other preventable causes. How can Indian civilians be expected to devise or in any large degree to approve the empiric methods that should be adopted in an endeavour to find a remedy ? At school and university lads are crammed with knowledge of classics and mathematics, history, languages, economics and law ;

and with this equipment they are sent out to rule over provinces whose fortunes depend on agriculture and are mainly threatened by disease. As for India and the other British dominions, so also at home. As professional men or officers in the services, church or state ; as thinkers and writers ; as fathers and landlords ; above all, as magistrates and judges, councillors and members of parliament, they are called on in their turn to play their part in national prosperity. The prosperity of the nation depends on its health ; its health depends on care and attention in every phase of life ; and this care, whether private or public, depends very largely on public opinion. It is the men from the public schools and universities to-day that will form the public opinion of to-morrow. In that sense we are at present taking no thought for the morrow ; we are turning out a body of men utterly ignorant and therefore indifferent to the prevention of preventable disease and to their future responsibilities in the maintenance of the public health. The remedy for this must be gradually formed. Immediate steps should be taken to establish lectureships and professorships for the laity in every university, to provide simple and attractive lectures and demonstrations in every school, to include in the compulsory syllabus of every final examination some knowledge of the principles and methods of individual, national and imperial health.

Much may be taught by museums and exhibitions, which, dealing with familiar subjects, can easily be made attractive. The crowded audiences at the tuberculosis exhibitions of recent years have been a

revelation of popular feeling. The museum for instruction in workmen's welfare at Berlin inspired a scheme for a similar permanent museum in London, now laid before the King Edward VII. Memorial Committee for London by the National League for Physical Education and Improvement.

If this be true of the men it is truer still of the women. The habits of the household depend mainly on the mother ; the influence of the woman on cleanliness, rest, food and the other conditions essential to health is supreme. Sick-nursing, midwifery and health-visiting are essentially womanly occupations ; it is on these that the main hope for improvement of the national health must in no small measure depend ; and every girl, in whatever station, should be taught not merely the dry principles of " domestic hygiene," but the practical application of these principles to her own and to the national life.

The health of the people is the supreme law. If this doctrine, properly interpreted, is thoroughly ingrained into the popular imagination, there is little doubt that the people will themselves demand that far more attention shall be paid to matters of health in the education of every child and in the administration of every department of life. The inevitable corollary is the co-operation of all the governments of the empire to this end ; and it is to be hoped that at the next meeting of the Imperial Conference time may be found for the discussion of a resolution presented to the conference of 1907 by the Royal Sanitary Institute to the effect elaborated in this final chapter. We of the British isles move

forward in the style of the kangaroo. In motors, in aeroplanes, in national insurance, to take three recent instances, we wait to use the experience of others ; we then give a mighty leap and land ahead of those who have inspired our move ; and there we stick till the world has again gone past us. In wise and liberal expenditure on education and research, and again in imperial organisation, we are far behind both the German Empire and the United States. Now at the opening of a new reign, here more especially in the question of the public health, is the occasion for the next leap of the British kangaroo. So may his Gracious Majesty King George be able to promote the health and welfare of his empire and in future days to say that ill-health, if preventable, has been prevented.

“ And the young king said : ‘ I have found it,  
 The road to the rest ye seek ;  
 The strong shall wait for the weary,  
 The hale shall halt for the weak ;  
 With the even tramp of an army,  
 Where no man breaks from the line,  
 Ye shall march to peace and plenty  
 In the bond of brotherhood—sign ! ’ ”  
 RUDYARD KIPLING.—“ An Imperial Rescript.”



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lected far and wide. The Mulkowal incident, a mere fly in the ointment, paralysed the Indian government, and the Plague Commission which reported in 1903 gave them little security or certainty as a basis for adopting any strong policy. As an instance might be noted the conclusions of the Plague Commission, that whereas, in an extensive system of examination of travellers at railway stations throughout the Indian Empire, very few cases of plague had been detected, all trammels on railway intercommunication should be suspended. But in point of fact this measure had indirectly limited communication, by deterring plague patients from travelling, and so to a very considerable extent preventing the dissemination of the disease. The rules were relaxed, and already, within a few months before I had left India, there was evidence to show that plague had broken out in certain villages to which it was previously unknown ; whereas in a few adjoining districts, where railway inspection still continued, plague was as yet unknown.

Education of the people is certainly the bedrock of all progress ; whether in schools or in the Press or by leaflets, posters, lantern slides and lectures. Little if anything was being done in this way in 1904 with a view to the arrest of the plague—just a memorandum issued to village authorities every now and then. But to educate, the government must have a method and a policy.

Whatever be the best method to adopt, there can be no doubt that in India we have an enormous field of research, of which insufficient use has hitherto

